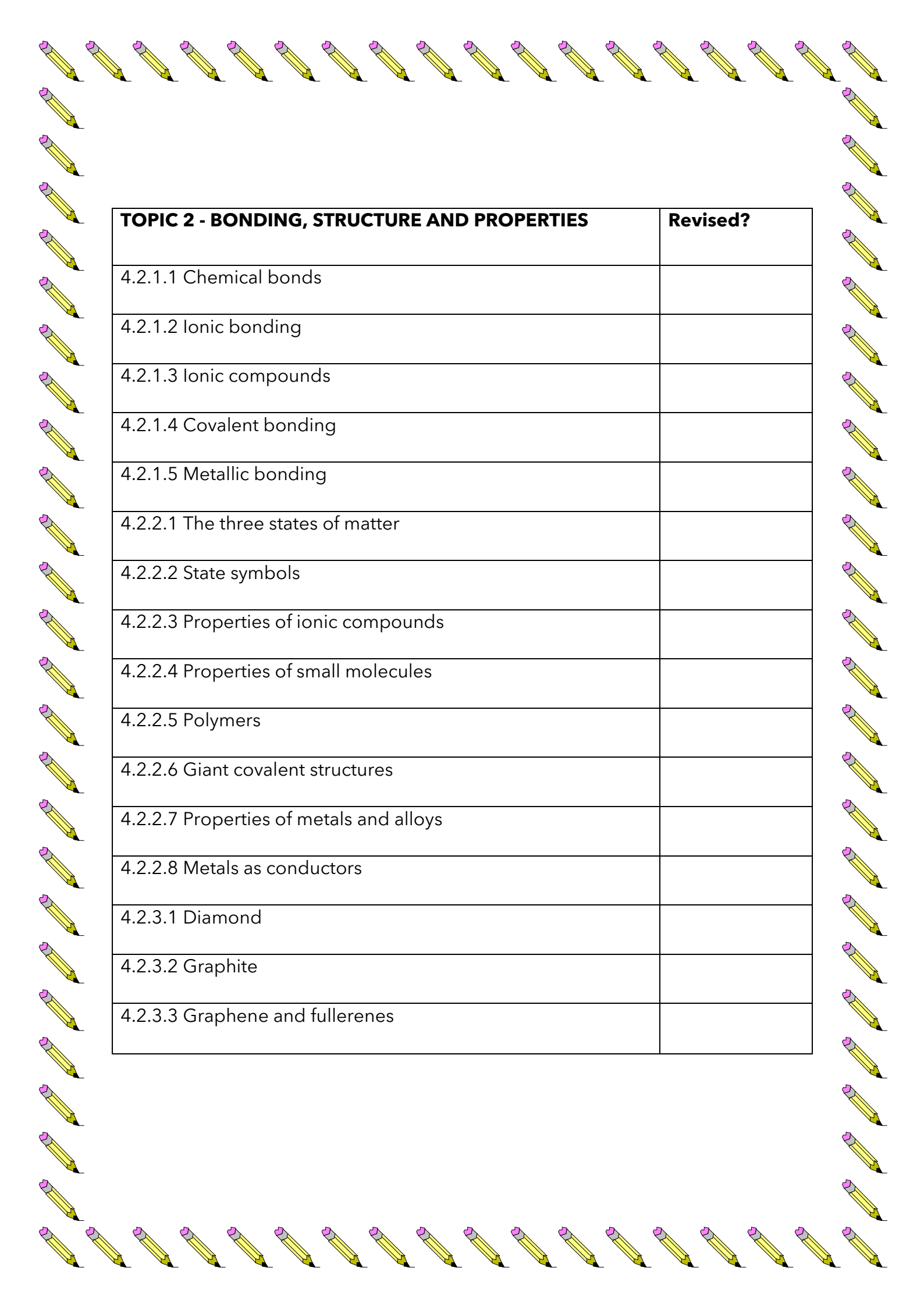


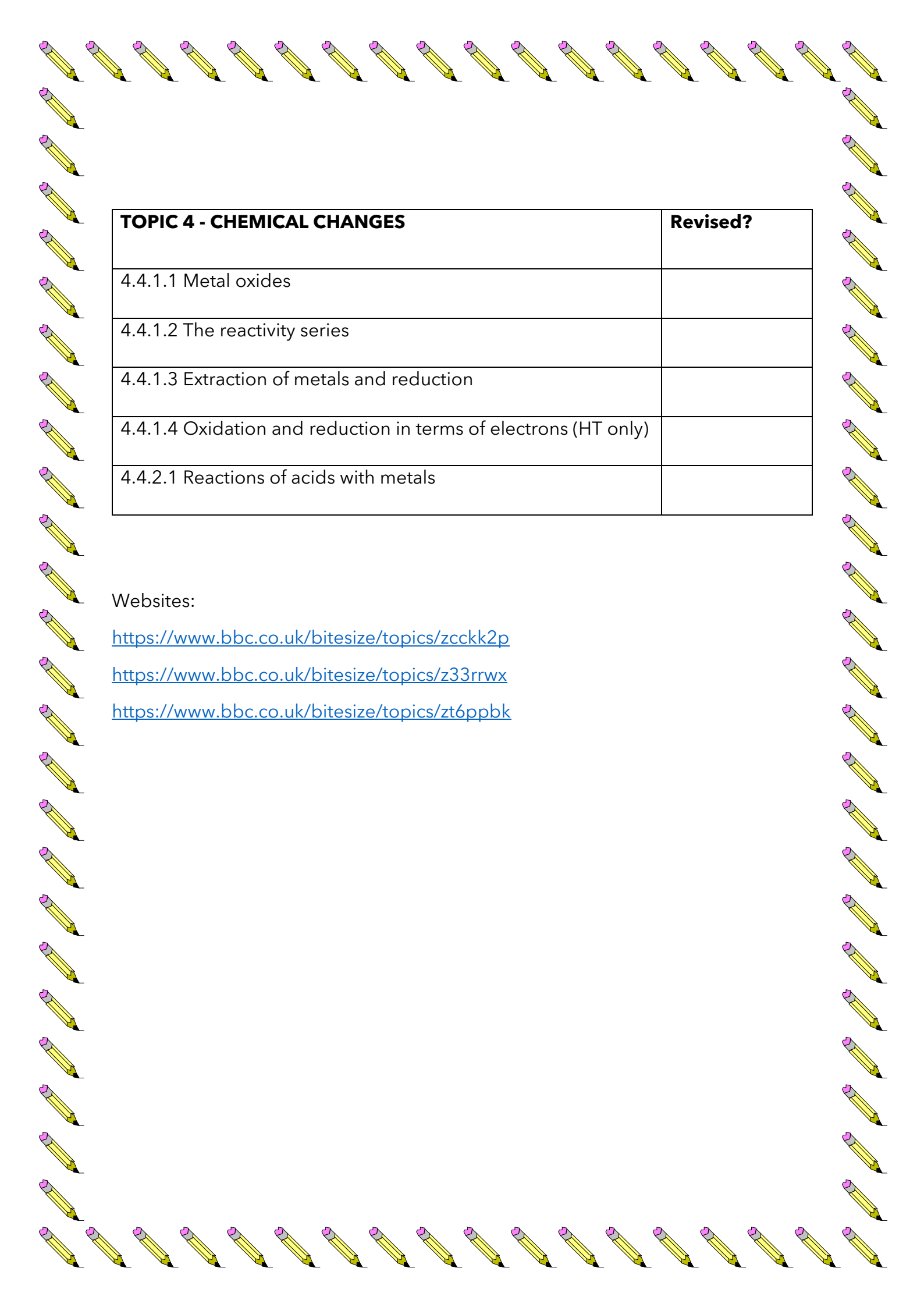


# Chemistry

<b>TOPIC 1 - ATOMIC STRUCTURE AND THE PERIODIC TABLE</b>	<b>Revised</b>
4.1.1.1 Atoms, elements and compounds	
4.1.1.2 Mixtures	
4.1.1.3 The development of the model of the atom	
4.1.1.4 Relative electrical charges of subatomic particles	
4.1.1.5 Size and mass of atoms	
4.1.1.6 Relative atomic mass	
4.1.1.7 Electronic structure	
4.1.2.1 The periodic table	
4.1.2.2 Development of the periodic table	
4.1.2.3 Metals and non-metals	
4.1.2.4 Group 0	
4.1.2.5 Group 1	
4.1.2.6 Group 7	



<b>TOPIC 2 - BONDING, STRUCTURE AND PROPERTIES</b>	<b>Revised?</b>
4.2.1.1 Chemical bonds	
4.2.1.2 Ionic bonding	
4.2.1.3 Ionic compounds	
4.2.1.4 Covalent bonding	
4.2.1.5 Metallic bonding	
4.2.2.1 The three states of matter	
4.2.2.2 State symbols	
4.2.2.3 Properties of ionic compounds	
4.2.2.4 Properties of small molecules	
4.2.2.5 Polymers	
4.2.2.6 Giant covalent structures	
4.2.2.7 Properties of metals and alloys	
4.2.2.8 Metals as conductors	
4.2.3.1 Diamond	
4.2.3.2 Graphite	
4.2.3.3 Graphene and fullerenes	



<b>TOPIC 4 - CHEMICAL CHANGES</b>	<b>Revised?</b>
4.4.1.1 Metal oxides	
4.4.1.2 The reactivity series	
4.4.1.3 Extraction of metals and reduction	
4.4.1.4 Oxidation and reduction in terms of electrons (HT only)	
4.4.2.1 Reactions of acids with metals	

Websites:

<https://www.bbc.co.uk/bitesize/topics/zcckk2p>

<https://www.bbc.co.uk/bitesize/topics/z33rrwx>

<https://www.bbc.co.uk/bitesize/topics/zt6ppbk>



# MFL

## **Paper 1: Reading and Listening topics**

- Family and relationships
- Hobbies and interests
- Celebrations
- Travel and holidays
- Local area and description of regions
- School and education
- Ambitions and plans for the future
- Environment and global issues
- Major international festivals and events

**Your teacher will provide you with a glossary to help with revision for the Reading and Listening**

## **Paper 2: Writing**

- Translation into French or Spanish on holidays (testing accuracy in past, present and future tenses)

**Longer writing task (80 - 150 words + in French or Spanish)**

### **Option 1: Family and relationships**

- A description of your family
- A recent family outing
- Your plans as a family for this summer
- Why family is important

### **Option 2: Global issues**

- An important problem facing the planet at the moment
- How you've helped the environment recently
- Actions in the future to help the planet
- The causes of damage to the environment



# Music

You have two assessments at the end of year 10. One is the ensemble performance that will take place during the last couple of weeks of the school year.

The other is a listening assessment that will encompass the set works covered this year:

- Music for a While
- Killer Queen
- Star Wars
- Release (tbc)
- Musical dictation
- Unfamiliar listening

These will be exam style questions as practised in class.



# Sociology

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## Paper 1:

Families and Household

Education

## Paper 2

Crime and Deviance

Social Stratification

***Sociological Research Methods and Sociological Theory is integrated throughout both exam papers.***

### AQA GCSE Skills

**AO1:** Demonstrate knowledge and understanding of sociological theories, concepts, evidence and methods. ***i.e. recall information***

**AO2:** Apply knowledge and understanding of sociological theories, concepts, evidence and methods.


**AO3:** Analyse and evaluate sociological theories, concepts, evidence and methods, and make judgments and draw conclusions

1. Multiple choice question (1)

- *Choose the correct answer out of 4. Defining key terms and recalling key basic facts.*

2. Describe...(3) and Identify and describe...(3)

- *Clear description with few inaccuracies*
- *Good knowledge and understanding of relevant sociological theories, concepts, evidence and methods*



3. From Item A examine one strength/weakness of the research...(2)  
**1 mark** - providing analysis of the item (by identifying possible strength) demonstrating line of argument relating to either methods or findings  
**1 mark** - providing evidence of evaluation (making judgment/reaching conclusion) by giving a reason why this is a strength

4. Identify and explain one factor/alternative factor...(4)

- Relevant factor selected
- Appropriate, detailed, well-developed explanation of relevant sociological theories, concepts, evidence and methods
- Good application to the context

5. Identify and explain one advantage/disadvantage...(4)

- Relevant advantage selected
- Appropriate, detailed, well-developed explanation of relevant sociological theories, concepts, evidence and methods
- Good application to the context

6. Identify and describe the research method...(4)

- Relevant research method selected
- Appropriate, detailed, well-developed description of relevant sociological theories, concepts, evidence and methods
- Good application to the context

7. Identify one \_\_\_\_\_ of...and explain how you would research this using/the impact of...(4)

- Relevant function selected
- Appropriate, detailed, well-developed explanation of relevant sociological theories, concepts, evidence and methods
- Good application to the context

8. Discuss how far sociologists would agree...(12)

- Detailed knowledge and understanding of sociological theories, concepts, evidence and methods
- Consistent use of key terms
- Sustained application of sociological theories, concepts, evidence and methods to the issues raised by the question
- Few or no inaccuracies or omissions
- Detailed critical analysis of sociological theories, concepts, evidence and methods
- Well-constructed arguments

Supported judgments and conclusions based on evidence



<b>Topic name; F+H</b> <b>Note * indicates the sociologist is a key thinker and you MUST know their key study</b>	<b>Tick</b>
<b>Functions of the Family</b> <ul style="list-style-type: none"> <li>- Functionalist view of the Family (Parsons*, Murdock)</li> <li>- Feminist view of the family (Liberal - Ann Oakley*, Marxist feminist and Radical feminist - Delphy and Leonard*)</li> <li>- Marxist view of the family (Zartesky* and Engles)</li> </ul> <b>Note: you must be aware of some evaluation of each of the perspectives for the different functions of the family</b>	
<b>Family Forms</b> <ul style="list-style-type: none"> <li>- Family types (nuclear, extended, reconstituted, lone-parent, same sex)</li> <li>- Family diversity (Rapoport and Rapoport* - Organisational, cultural, social class, life-course and cohort diversity)</li> <li>- Alternatives to the family (Kibbutz, communes)</li> <li>- Families in a global context (Asia vs Caribbean)</li> </ul>	
<b>Conjugal Roles</b> <ul style="list-style-type: none"> <li>- Different views of conjugal role relationships (joint, segregated, domestic division of labour)</li> <li>- The feminist perspective on roles - Ann Oakley* (contrast with functionalist and Marxist)</li> </ul>	
<b>Changing relationship within the family</b> <ul style="list-style-type: none"> <li>- The symmetrical family (Willmott and Young*)</li> <li>- Changing relationships within family (how relationships within families have changes over time = pre-industrial, industrial and contemporary society)</li> <li>- Child centred families, the quality of parenting, problems in childhood (social media, computer games)</li> </ul>	
<b>Changing patterns</b> <ul style="list-style-type: none"> <li>- Marriage (Types of marriage, trends, reasons for changes)</li> <li>- Divorce (trends, reasons for changes, consequences of divorce, theories on divorce)</li> </ul>	



<b>Topic name: Education</b> <b>Note * indicates the sociologist is a key thinker and you MUST know their key study</b>	<b>Tick</b>
<b>Functions of the Education</b> <ul style="list-style-type: none"> <li>- Functionalist view of the Education (Parsons*, Durkheim*)</li> <li>- Feminist view of the Education</li> <li>- Marxist view of the family (Bowles and Gintis*)</li> </ul> <b>Note: you must be aware of some evaluation of each of the perspectives for their view on education</b>	
<b>Education types</b> <ul style="list-style-type: none"> <li>- Types of school's - private, public, faith, academies, specialist</li> <li>- Alternatives to education, home school and de-schooling</li> </ul> <b>Note: you must be aware of some evaluation of each type of school</b>	
<b>Educational achievement</b> <ul style="list-style-type: none"> <li>- Class (working class achieve lower GCSE/Alevel results)</li> <li>- <b>Internal and external explanations (cultural deprivation, cultural capital, linguistic deprivation, material deprivation, labelling + SFP, setting and streaming, subcultures)</b></li> </ul> <b>Ball* key study</b> <b>Halsey, Heath and Ridge* Key study</b>	
<b>Educational achievement</b> <ul style="list-style-type: none"> <li>- Gender</li> <li>- <b>Internal and external explanations (socialisation, legal changes, socialisation, subcultures, labelling + SFP)</b></li> <li>- <b>Willis Key study</b></li> </ul>	
<b>Educational achievement</b> <ul style="list-style-type: none"> <li>- Ethnicity</li> <li>- Internal and external (ethnocentric, socialisation, family structure, labelling and SFP, subcultures)</li> </ul>	
<b>Education policies</b> <ul style="list-style-type: none"> <li>- Marketisation and privatisation</li> <li>- 1944 tripartite system</li> <li>- 1988 education refort act - league tables, Ofsted, parentocracy</li> <li>- 1997 new labour policies e.g. PP/FSM</li> <li>- 2010 coalition policies e.g. changes to exams, grades, academies, free schools</li> </ul> <b>Ball, Bowe, Gerwitz Key study*</b>	



**Revision websites:**

[GCSE - ReviseSociology](#)

[hectic teacher sociology - Search \(bing.com\)](#)

<https://www.bbc.com/news>

**Revision ideas:**

- Create flashcards (full version and mini version) - do this of content, key words, sociologists, key studies
- Practice LOTS of exam questions writing and planning. Do this in timed and not timed conditions. These can be found in revision booklet I gave you OR on AQA's website. I am happy to mark these for you.
- Ask family/friends/guardians to test your knowledge using your flashcards/mindmaps etc.



# History

**In this exam you will be sitting a 1-hour Germany paper.**

**Where can I get the information?**

- You only need to revise the list below - don't revise all knowledge maps or all the knowledge in your books**
- USE YOUR EXERCISE BOOKS!!**
- Knowledge maps on all topics - on TEAMS
- Flash cards on all topics - on TEAMS
- Use your class notes.
- Notes/revision from extended study
- Use My Revision Notes guide or other revision guides purchased.
- USE GCSEPOD!

**Paper 1A - Germany 1890-1945**

		Started	Revisited	Consolidat	Tested my
<b>Germany 1890-1945 Democracy and Dictatorship</b>					
Kaiser Wilhelm and the difficulties of ruling Germany	The growth of parliamentary government (rise of the SPD and working classes)				
	The influence of Prussian militarism and industrialisation				
	Social reform and the growth of socialism				
	The domestic importance of the Navy Laws.				
Impact of the First World War:	War weariness and economic problems				
	defeat and abdication of the Kaiser - the end of the monarchy				
Weimar democracy: political change and unrest, 1919-1923	Including Spartacist Uprising, Kapp Putsch, Red Ruhr Rising and the Munich Putsch				
The extent of recovery during the Stresemann era (1924-1929)	Economic developments including the new currency, Dawes Plan and the Young Plan				
	The impact of international agreements on recovery: League of Nations, Locarno Pact, Kellogg-Briand Pact				
	Weimar culture.				
Germany and the Depression	The impact of the Depression: growth in support for the Nazis and other extremist parties (1928-1932).				
	The role of the SA				
	Hitler's appeal to the German people				
	The failure of Weimar democracy: election results; the role of Papen and Hindenburg and Hitler's appointment as Chancellor.				
The experience of Germany under the Nazis	Social policy and practice: and their people and youth groups.				
	Education; control of churches and religion; Aryan ideas, racial policy and persecution; the Final Solution.				



# French

## EoY GLOSSARY, READING & LISTENING

### Reading:

Aller au cinéma - going to the cinema

années - years

avant-hier - the day before yesterday

avec eux - with them

beaucoup d'arbres - lots of trees

c'est bruyant - it's noisy

ce serait mieux - it would be better

commencer a sourire - to start to smile

créer beaucoup d'emplois - create lots of jobs

d'habitude - usually

des espaces verts - green spaces

deuxième/troisième/quatrième - 1st/2<sup>nd</sup>/3<sup>rd</sup>

dix-sept/huit/neuf - 17/18/19

elle courait vite - she ran fast

Elle éteint - she turns off

elle ne riait pas - she didn't laugh

elle prend - she takes

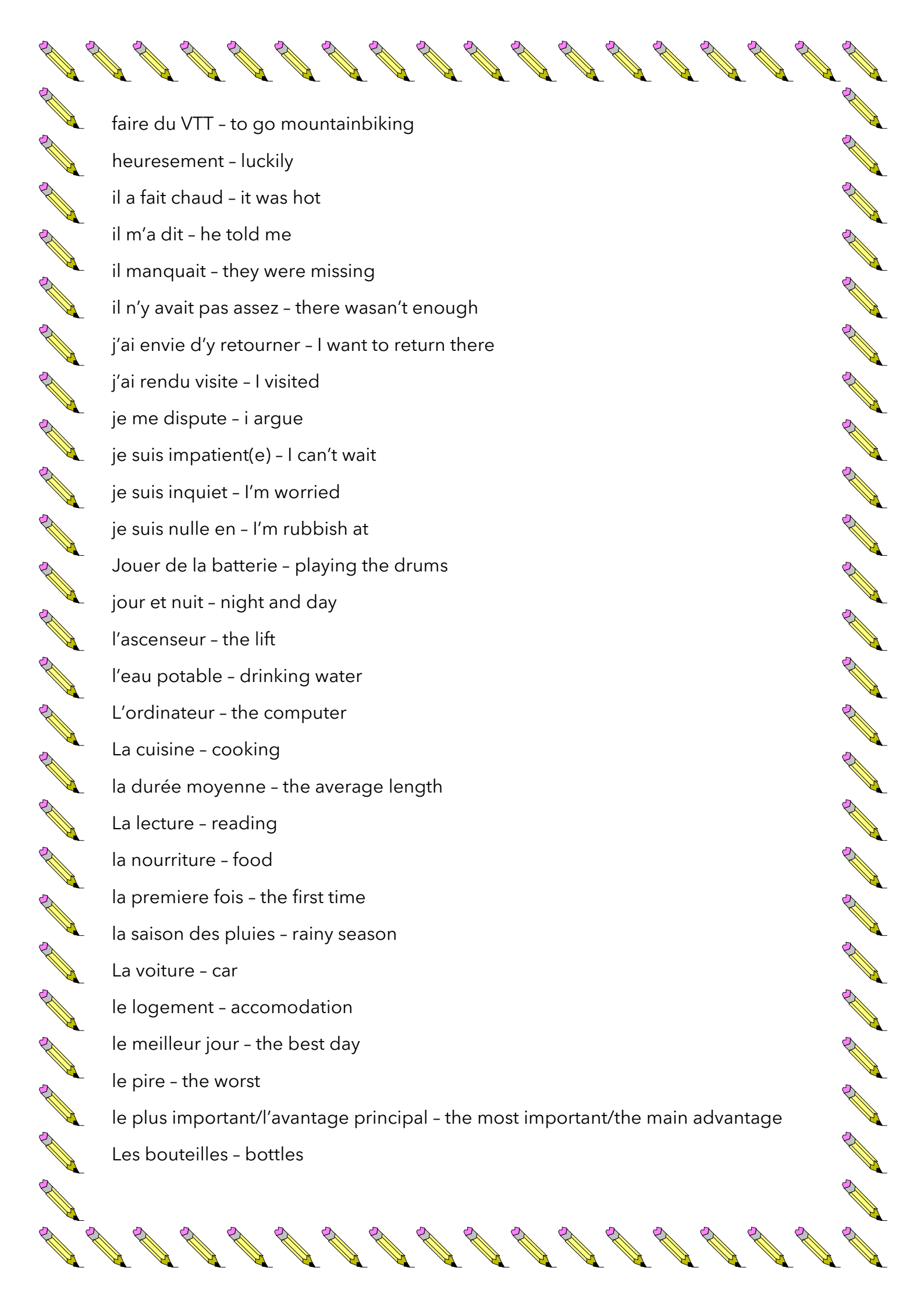
elle va m'entendre - she'll hear me

En vélo - by bike

ennuyeux - boring

étage - floor (of a building)

faire de la voile - to go sailing



faire du VTT - to go mountainbiking

heureusement - luckily

il a fait chaud - it was hot

il m'a dit - he told me

il manquait - they were missing

il n'y avait pas assez - there wasn't enough

j'ai envie d'y retourner - I want to return there

j'ai rendu visite - I visited

je me dispute - i argue

je suis impatient(e) - I can't wait

je suis inquiet - I'm worried

je suis nulle en - I'm rubbish at

Jouer de la batterie - playing the drums

jour et nuit - night and day

l'ascenseur - the lift

l'eau potable - drinking water

L'ordinateur - the computer

La cuisine - cooking

la durée moyenne - the average length

La lecture - reading

la nourriture - food

la première fois - the first time

la saison des pluies - rainy season

La voiture - car

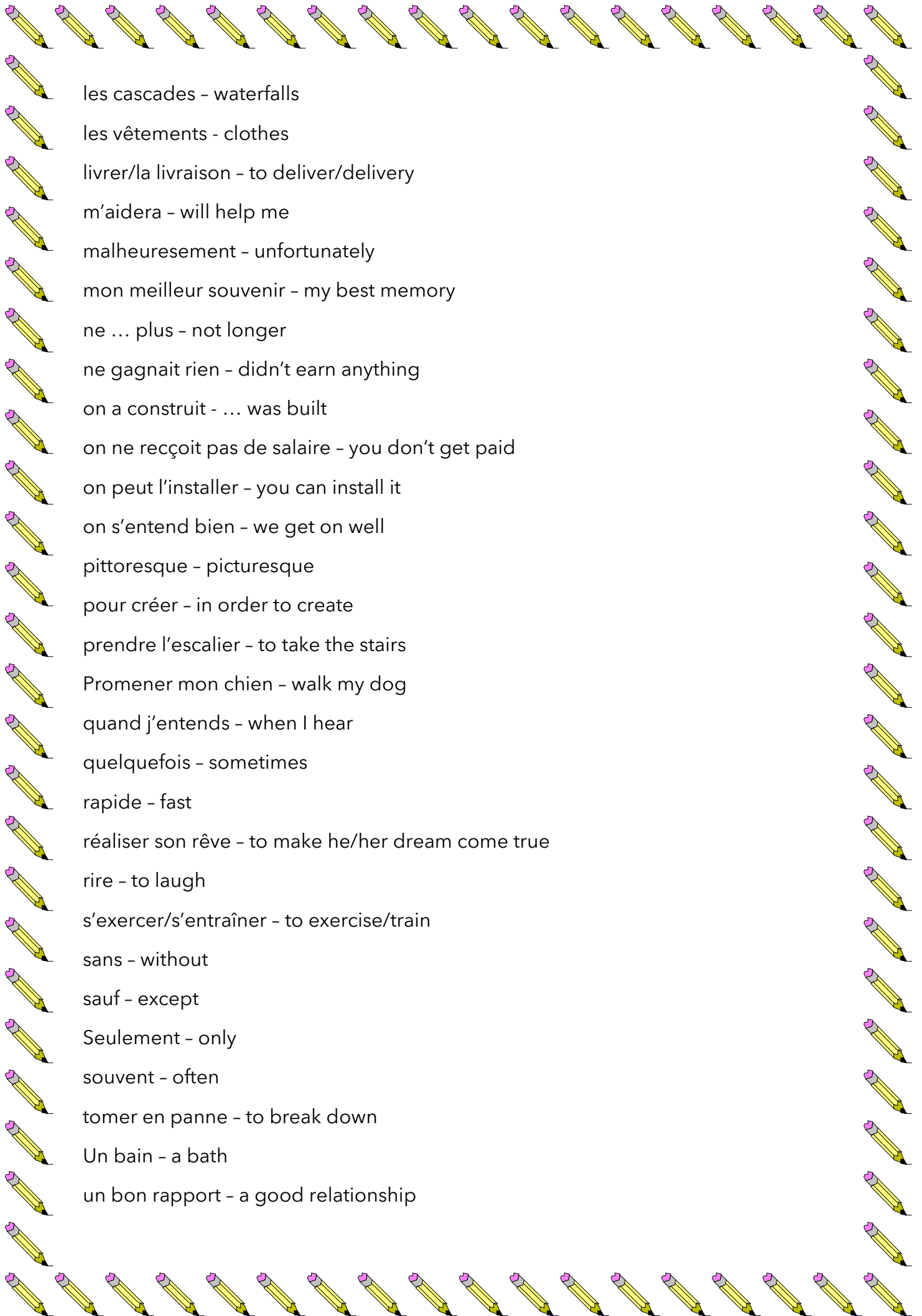
le logement - accomodation

le meilleur jour - the best day

le pire - the worst

le plus important/l'avantage principal - the most important/the main advantage

Les bouteilles - bottles



les cascades - waterfalls

les vêtements - clothes

livrer/la livraison - to deliver/delivery

m'aidera - will help me

malheureusement - unfortunately

mon meilleur souvenir - my best memory

ne ... plus - not longer

ne gagnait rien - didn't earn anything

on a construit - ... was built

on ne reçoit pas de salaire - you don't get paid

on peut l'installer - you can install it

on s'entend bien - we get on well

pittoresque - picturesque

pour créer - in order to create

prendre l'escalier - to take the stairs

Promener mon chien - walk my dog

quand j'entends - when I hear

quelquefois - sometimes

rapide - fast

réaliser son rêve - to make he/her dream come true

rire - to laugh

s'exercer/s'entraîner - to exercise/train

sans - without

sauf - except

Seulement - only

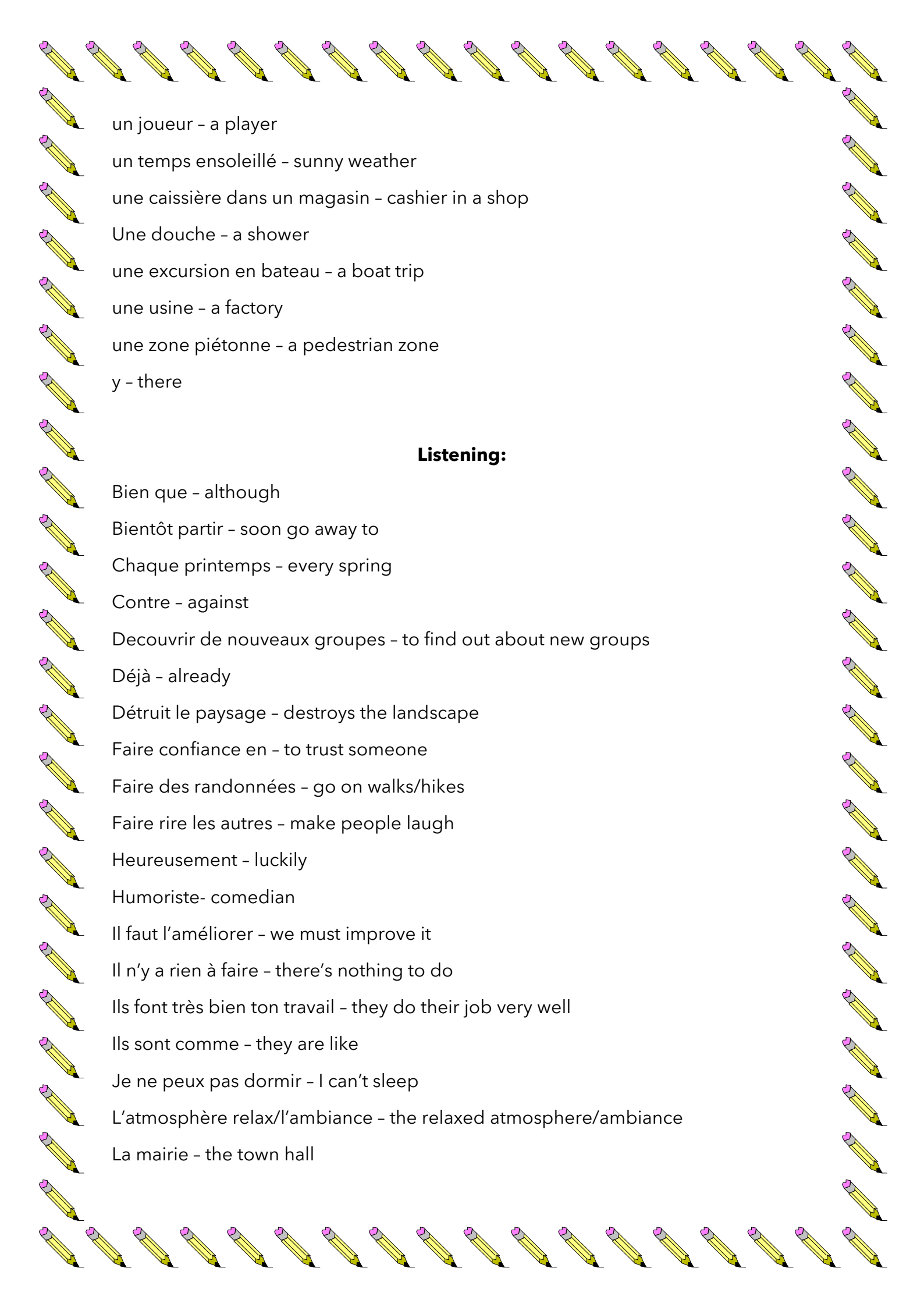
souvent - often

tomber en panne - to break down

Un bain - a bath

un bon rapport - a good relationship





un joueur - a player

un temps ensoleillé - sunny weather

une caissière dans un magasin - cashier in a shop

Une douche - a shower

une excursion en bateau - a boat trip

une usine - a factory

une zone piétonne - a pedestrian zone

y - there

### Listening:

Bien que - although

Bientôt partir - soon go away to

Chaque printemps - every spring

Contre - against

Decouvrir de nouveaux groupes - to find out about new groups

Déjà - already

Détruit le paysage - destroys the landscape

Faire confiance en - to trust someone

Faire des randonnées - go on walks/hikes

Faire rire les autres - make people laugh

Heureusement - luckily

Humoriste- comedian

Il faut l'améliorer - we must improve it

Il n'y a rien à faire - there's nothing to do

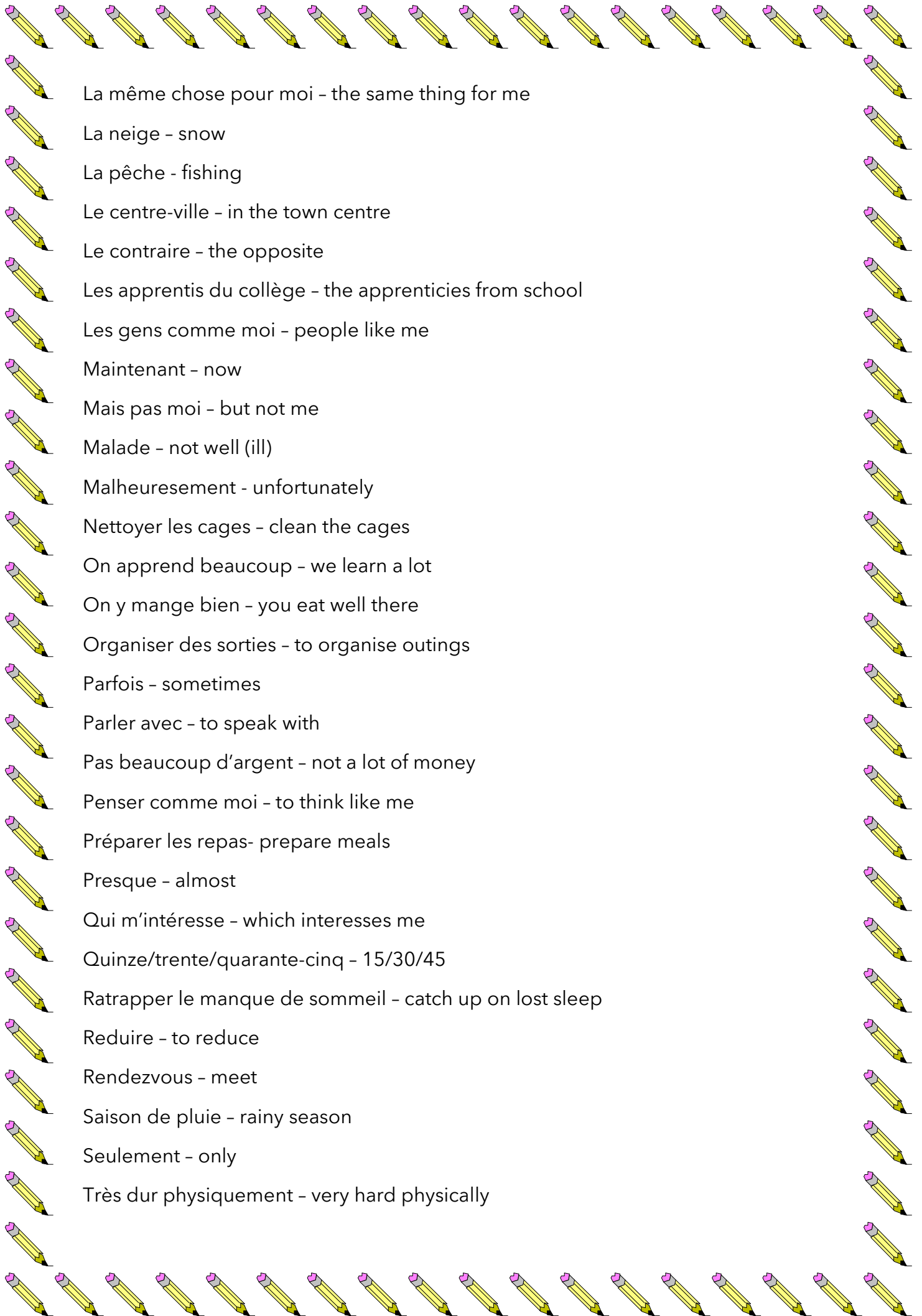
Ils font très bien ton travail - they do their job very well

Ils sont comme - they are like

Je ne peux pas dormir - I can't sleep

L'atmosphère relax/l'ambiance - the relaxed atmosphere/ambiance

La mairie - the town hall



La même chose pour moi - the same thing for me

La neige - snow

La pêche - fishing

Le centre-ville - in the town centre

Le contraire - the opposite

Les apprentis du collège - the apprentices from school

Les gens comme moi - people like me

Maintenant - now

Mais pas moi - but not me

Malade - not well (ill)

Malheureusement - unfortunately

Nettoyer les cages - clean the cages

On apprend beaucoup - we learn a lot

On y mange bien - you eat well there

Organiser des sorties - to organise outings

Parfois - sometimes

Parler avec - to speak with

Pas beaucoup d'argent - not a lot of money

Penser comme moi - to think like me

Préparer les repas- prepare meals

Presque - almost

Qui m'intéresse - which interests me

Quinze/trente/quarante-cinq - 15/30/45

Rattrapper le manque de sommeil - catch up on lost sleep

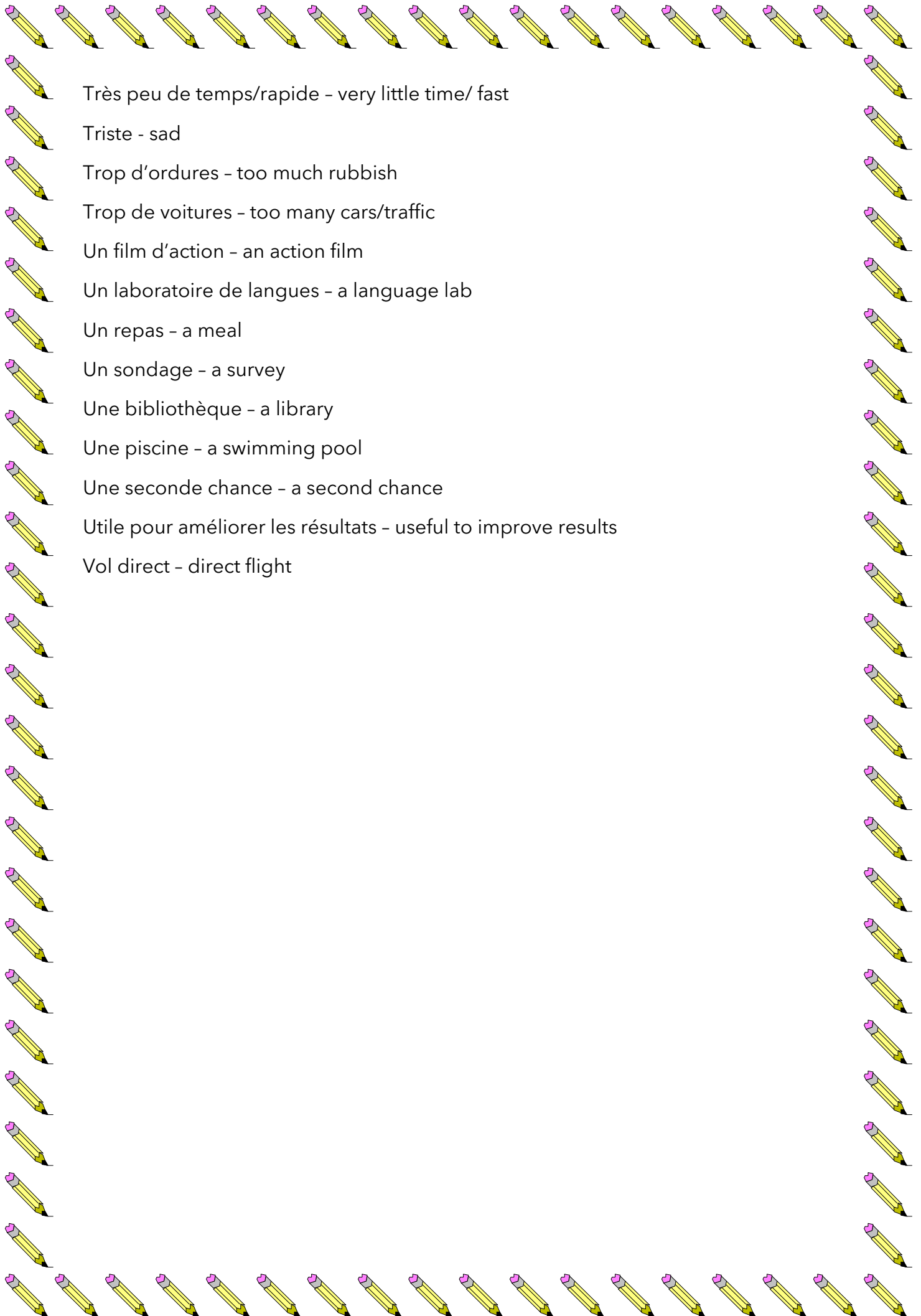
Reduire - to reduce

Rendezvous - meet

Saison de pluie - rainy season

Seulement - only

Très dur physiquement - very hard physically



Très peu de temps/rapide - very little time/ fast

Triste - sad

Trop d'ordures - too much rubbish

Trop de voitures - too many cars/traffic

Un film d'action - an action film

Un laboratoire de langues - a language lab

Un repas - a meal

Un sondage - a survey

Une bibliothèque - a library

Une piscine - a swimming pool

Une seconde chance - a second chance

Utile pour améliorer les résultats - useful to improve results

Vol direct - direct flight



# PE

## Paper 1 Revision List

General Paper 1 Revision Links:

<https://www.youtube.com/live/j8QD3Gh8MrY?feature=share>

<https://www.youtube.com/watch?v=k3qPGBafSHk>

<https://www.youtube.com/watch?v=hxCIJ9kvorc>

Topic Area	Learner Must:	Red	Amber	Green
<b>1.1. a. The structure and function of the skeletal system</b>				
<b>Helpful Revision Links:</b> <a href="https://theeverlearner.com/course-37/lesson/the-skeleton-4">https://theeverlearner.com/course-37/lesson/the-skeleton-4</a> <a href="https://youtu.be/77OD2T3D3a4">https://youtu.be/77OD2T3D3a4</a> <a href="https://youtu.be/j1JR_3reHcY">https://youtu.be/j1JR_3reHcY</a>				
Location of major bones	<ul style="list-style-type: none"> <li>• know the name and location of the following bones in the human body:</li> <li>- cranium                      - vertebrae                      - ribs</li> <li>- sternum                      - clavicle                      - scapula</li> <li>- pelvis                      - humerus                      - ulna</li> <li>- radius                      - carpals                      - metacarpals</li> <li>- phalanges                      - femur                      - patella</li> <li>- tibia                      - fibula                      - tarsals</li> <li>- metatarsals</li> </ul>			
Functions of the skeleton	<ul style="list-style-type: none"> <li>• understand and be able to apply examples of how the skeleton provides or allows:</li> <li>- support                      - posture</li> <li>- protection                      - movement</li> <li>- blood cell production                      - storage of minerals</li> </ul>			
Types of synovial joint	<ul style="list-style-type: none"> <li>• know the definition of a synovial joint.</li> <li>• know the following hinge joints:</li> <li>- knee - articulating bones - femur, tibia</li> <li>- elbow - articulating bones - humerus, radius, ulna.</li> <li>• know the following ball and socket joints:</li> <li>- shoulder - articulating bones - humerus, scapula</li> <li>- hip - articulating bones - pelvis, femur.</li> </ul>			
Types of movement at hinge joints and ball and socket joints	<ul style="list-style-type: none"> <li>• know the types of movement at hinge joints and be able to apply them to examples from physical activity/sport:</li> <li>- flexion</li> <li>- extension</li> <li>• know the types of movement at ball and socket joints and be able to apply them to examples from physical activity/sport:</li> <li>- flexion                      - extension</li> <li>- rotation                      - abduction</li> <li>- adduction                      - circumduction</li> </ul>			
Other components of joints	<ul style="list-style-type: none"> <li>• know the roles of: ligament, cartilage and tendons</li> </ul>			

### 1.1. b. The structure and function of the muscular system

**Helpful Revision Links:**

<https://youtu.be/AHVUdKwVpBI>

[https://youtu.be/ZZBvmvzl\\_Fw](https://youtu.be/ZZBvmvzl_Fw)

[https://youtu.be/WthD\\_etW97g](https://youtu.be/WthD_etW97g)

Location of major muscle groups	<ul style="list-style-type: none"> <li>• know the name and location of the following muscle groups in the human body and be able to apply their use to examples from physical activity/sport:             <ul style="list-style-type: none"> <li>- deltoid</li> <li>- latissimus dorsi</li> <li>- biceps</li> <li>- abdominals</li> <li>- hamstrings</li> <li>- gastrocnemius</li> <li>- trapezius</li> <li>- pectorals</li> <li>- triceps</li> <li>- quadriceps</li> <li>- gluteals</li> </ul> </li> </ul>			
The roles of muscle in movement	<ul style="list-style-type: none"> <li>• know the definitions and roles of the following and be able to apply them to examples from physical activity/sport:             <ul style="list-style-type: none"> <li>- agonist</li> <li>- fixator</li> <li>- antagonist</li> <li>- antagonistic muscle action</li> </ul> </li> </ul>			

### 1.1. c. Movement analysis

**Helpful Revision Links:**

<https://youtu.be/J5eFnUn9yZk>

Lever systems	<ul style="list-style-type: none"> <li>• know the three classes of lever and their use in physical activity and sport:             <ul style="list-style-type: none"> <li>- 1st class - neck</li> <li>- 2nd class - ankle</li> <li>- 3rd class - elbow</li> </ul> </li> <li>• know the definition of mechanical advantage.</li> </ul>			
Planes of movement and axes of rotation	<ul style="list-style-type: none"> <li>• know the location of the planes of movement in the body and their application to physical activity and sport:             <ul style="list-style-type: none"> <li>- frontal</li> <li>- transverse</li> <li>- sagittal.</li> </ul> </li> <li>• know the location of the axes of rotation in the body and their application to physical activity and sport:             <ul style="list-style-type: none"> <li>- frontal</li> <li>- transverse</li> <li>- longitudinal</li> </ul> </li> </ul>			

## 1.1. d. The cardiovascular and respiratory systems

### Helpful Revision Links:

<https://theeverlearner.com/course-37/lesson/double-loop-blood-flow-1>

[https://youtu.be/CIEA\\_NB\\_Jcc](https://youtu.be/CIEA_NB_Jcc)

<p>Structure and function of the cardiovascular system</p>	<ul style="list-style-type: none"> <li>• know the double-circulatory system (systemic and pulmonary).</li> <li>• know the different types of blood vessel:               <ul style="list-style-type: none"> <li>- arteries</li> <li>- capillaries</li> <li>- veins</li> </ul> </li> <li>• understand the pathway of blood through the heart:               <ul style="list-style-type: none"> <li>- atria</li> <li>- ventricles</li> <li>- bicuspid, tricuspid and semilunar valves</li> <li>- septum and major blood vessels:                   <ul style="list-style-type: none"> <li>- aorta</li> <li>- pulmonary artery</li> <li>- vena cava</li> <li>- pulmonary vein.</li> </ul> </li> </ul> </li> <li>• know the definitions of:               <ul style="list-style-type: none"> <li>- heart rate</li> <li>- stroke volume</li> <li>- cardiac output.</li> </ul> </li> <li>• know the role of red blood cells</li> </ul>			
<p>Structure and function of the respiratory system</p>	<ul style="list-style-type: none"> <li>• understand the pathway of air through the respiratory system:               <ul style="list-style-type: none"> <li>- mouth</li> <li>- nose</li> <li>- trachea</li> <li>- bronchi</li> <li>- bronchiole</li> <li>- alveoli.</li> </ul> </li> <li>• know the role of respiratory muscles in breathing:               <ul style="list-style-type: none"> <li>- diaphragm</li> <li>- intercostals.</li> </ul> </li> <li>• know the definitions of:               <ul style="list-style-type: none"> <li>- breathing rate</li> <li>- tidal volume</li> <li>- minute ventilation.</li> </ul> </li> <li>• understand about alveoli as the site of gas exchange</li> </ul>			
<p>Aerobic and anaerobic exercise</p>	<ul style="list-style-type: none"> <li>• know the definitions of:               <ul style="list-style-type: none"> <li>- aerobic exercise</li> <li>- anaerobic exercise.</li> </ul> </li> <li>• be able to apply practical examples of aerobic and anaerobic activities in relation to intensity and duration</li> </ul>			



### 1.1. e. Effects of exercise on body systems

#### Helpful Revision Links:

<https://youtu.be/A9dlsuCEcc4>

<https://youtu.be/glz2BCEllyQ>

Short-term effects of exercise

- understand the short-term effects of exercise on:
  - muscle temperature
  - heart rate, stroke volume, cardiac output
  - redistribution of blood flow during exercise
  - respiratory rate, tidal volume, minute ventilation
  - oxygen to the working muscles
  - lactic acid production.
- be able to apply the effects to examples from physical activity/sport.
- be able to collect and use data relating to short-term effects of exercise

Long-term (training) effects of exercise

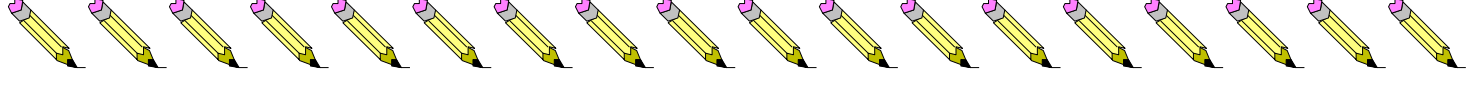
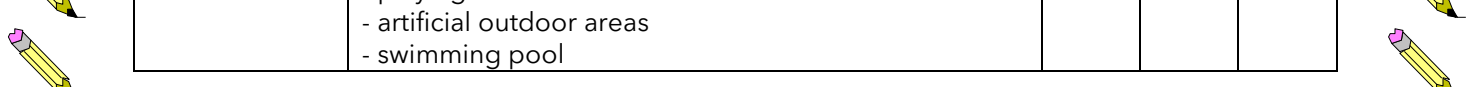
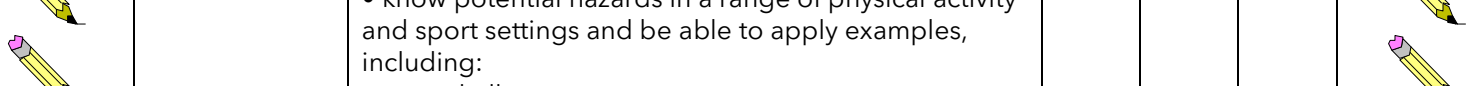
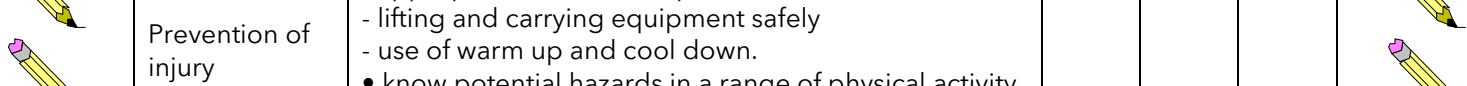
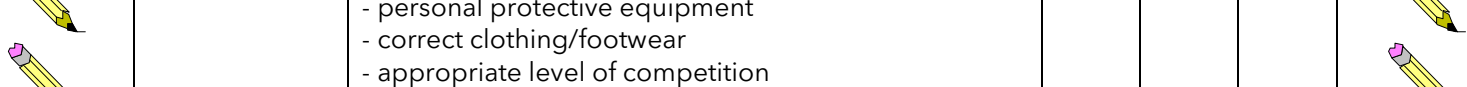
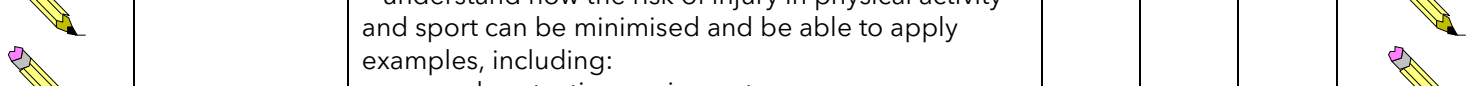
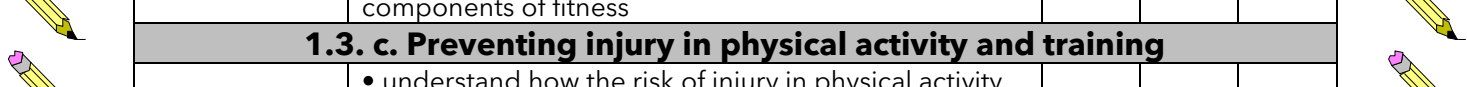
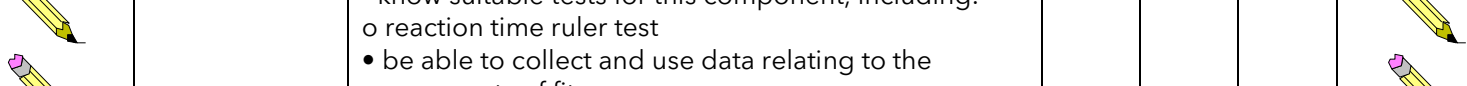
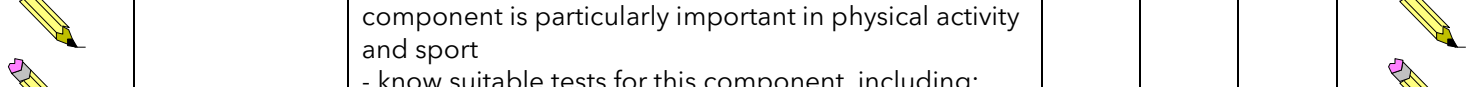
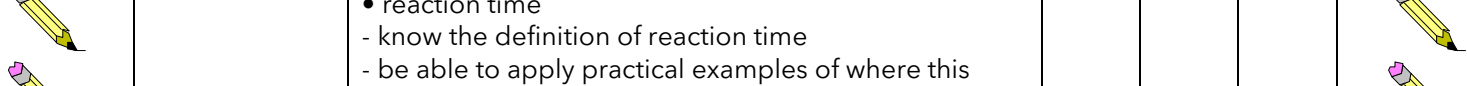
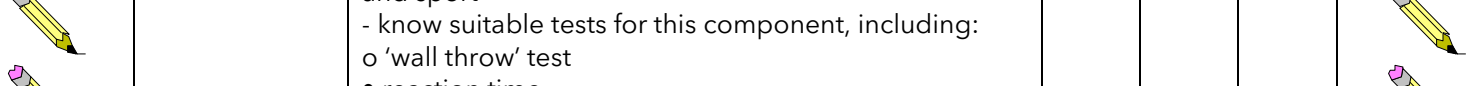
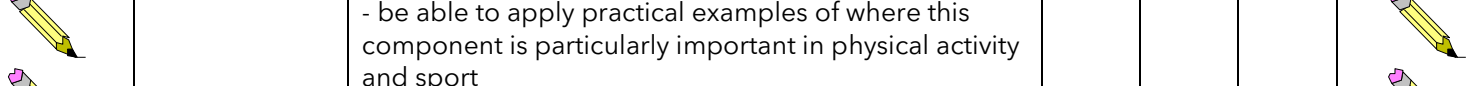
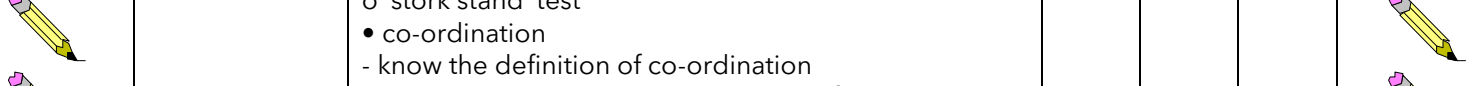
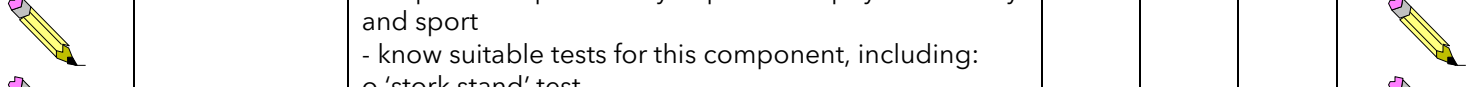
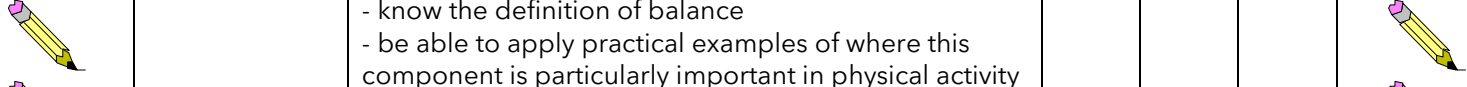
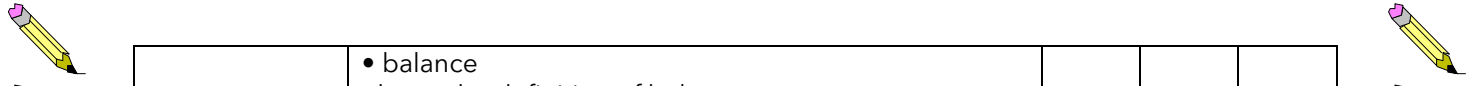
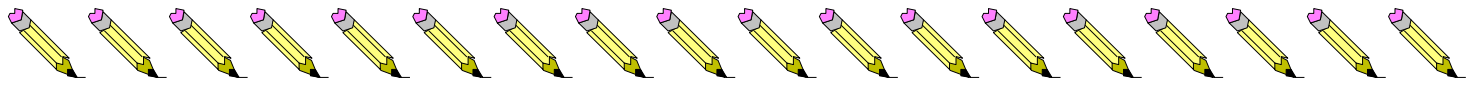
- understand the long-term effects of exercise on:
  - bone density
  - hypertrophy of muscle
  - muscular strength
  - muscular endurance
  - resistance to fatigue
  - hypertrophy of the heart
  - resting heart rate and resting stroke volume
  - cardiac output
  - rate of recovery
  - aerobic capacity
  - respiratory muscles
  - tidal volume and minute volume during exercise
  - capillarisation.
- be able to apply the effects to examples from physical activity/sport.
- be able to collect and use data relating to long-term effects of exercise

## 1.2. a. Components of fitness

Components of fitness

Know the following components of fitness:

- cardiovascular endurance/stamina
  - know the definition of cardiovascular endurance/stamina
  - be able to apply practical examples where this component is particularly important in physical activity and sport
  - know suitable tests for this component, including:
    - o Cooper 12 minute run/walk test
    - o multi-stage fitness test
- muscular endurance
  - know the definition of muscular endurance
  - be able to apply practical examples where this component is particularly important in physical activity and sport
  - know suitable tests for this component, including:
    - o press-up test
    - o sit-up test
- speed
  - know the definition of speed
  - be able to apply practical examples where this component is particularly important in physical activity and sport
  - know suitable tests for this component, including:
    - o 30m sprint test
- strength
  - know the definition of strength
  - be able to apply practical examples of where this component is particularly important in physical activity and sport
  - know suitable tests for this component, including:
    - o grip strength dynamometer test
    - o 1 Repetition Maximum (RM)
- power
  - know the definition of power
  - be able to apply practical examples of where this component is particularly important in physical activity and sport
  - know suitable tests for this component, including:
    - o 'standing jump' or 'vertical jump' tests
- flexibility
  - know the definition of flexibility
  - be able to apply practical examples of where this component is particularly important in physical activity and sport
  - know suitable tests for this component, including:
    - o 'sit and reach' test
- agility
  - know the definition of agility
  - be able to apply practical examples of where this component is particularly important in physical activity and sport
  - know suitable tests for this component, including:
    - o Illinois agility test

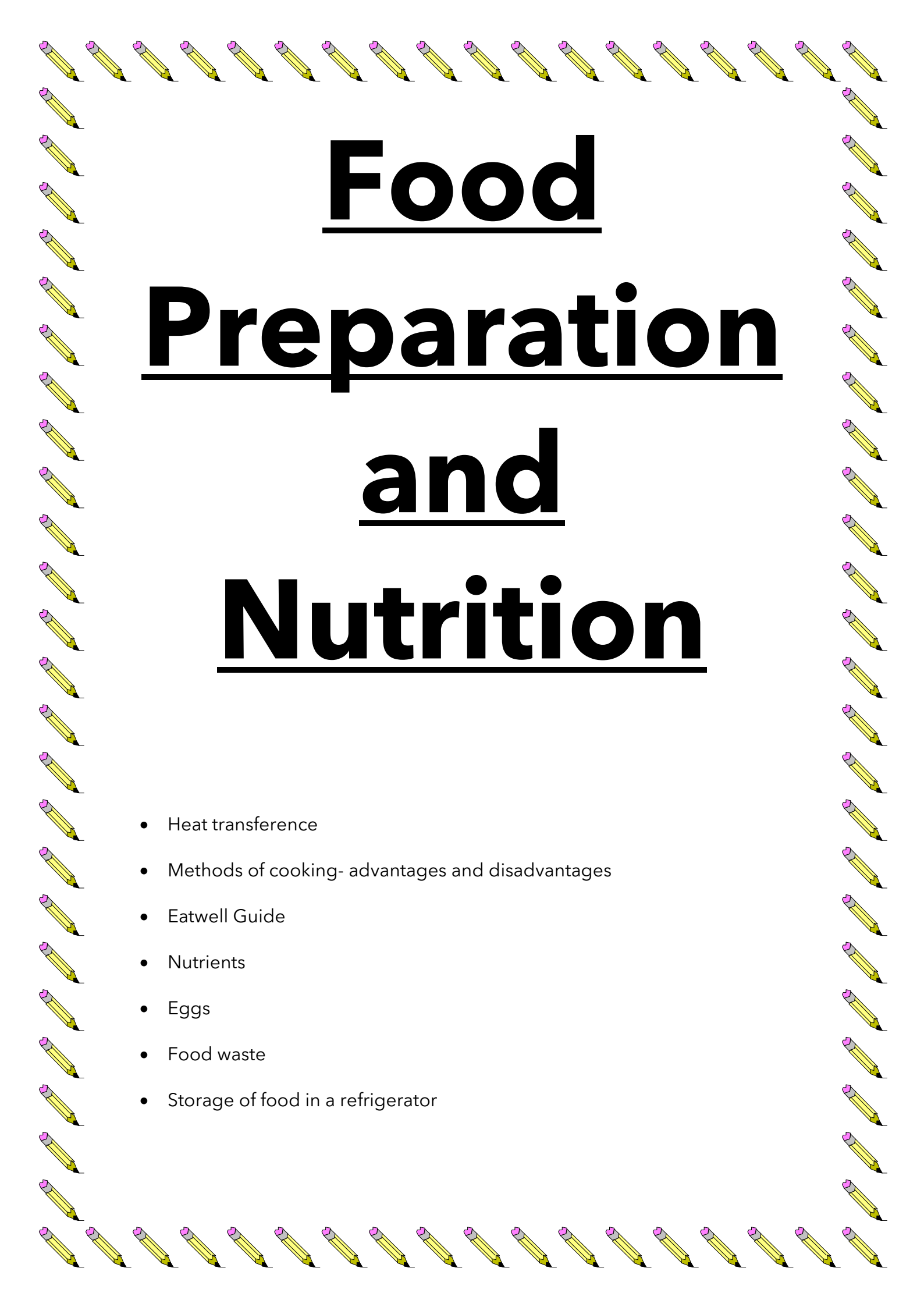


	<ul style="list-style-type: none"><li>• balance<ul style="list-style-type: none"><li>- know the definition of balance</li><li>- be able to apply practical examples of where this component is particularly important in physical activity and sport</li></ul></li><li>- know suitable tests for this component, including:<ul style="list-style-type: none"><li>o 'stork stand' test</li></ul></li><li>• co-ordination<ul style="list-style-type: none"><li>- know the definition of co-ordination</li><li>- be able to apply practical examples of where this component is particularly important in physical activity and sport</li></ul></li><li>- know suitable tests for this component, including:<ul style="list-style-type: none"><li>o 'wall throw' test</li></ul></li><li>• reaction time<ul style="list-style-type: none"><li>- know the definition of reaction time</li><li>- be able to apply practical examples of where this component is particularly important in physical activity and sport</li></ul></li><li>- know suitable tests for this component, including:<ul style="list-style-type: none"><li>o reaction time ruler test</li></ul></li><li>• be able to collect and use data relating to the components of fitness</li></ul>			
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**1.3. c. Preventing injury in physical activity and training**

Prevention of injury	<ul style="list-style-type: none"><li>• understand how the risk of injury in physical activity and sport can be minimised and be able to apply examples, including:<ul style="list-style-type: none"><li>- personal protective equipment</li><li>- correct clothing/footwear</li><li>- appropriate level of competition</li><li>- lifting and carrying equipment safely</li><li>- use of warm up and cool down.</li></ul></li><li>• know potential hazards in a range of physical activity and sport settings and be able to apply examples, including:<ul style="list-style-type: none"><li>- sports hall</li><li>- fitness centre</li><li>- playing field</li><li>- artificial outdoor areas</li><li>- swimming pool</li></ul></li></ul>			
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# Food

# Preparation

# and

# Nutrition

- Heat transference
- Methods of cooking- advantages and disadvantages
- Eatwell Guide
- Nutrients
- Eggs
- Food waste
- Storage of food in a refrigerator



# Design & Technology

- Soldering process- equipment, health and safety and process
- Waste material process
- Consumer choices around the sustainability of a product
- Specifications
- Anthropometrics
- Surface finishes



# Economics

Units 1 and 2 make up the content for Paper 1 (Microeconomics)

## Exam paper structure

Section A – 20 multiple choice questions

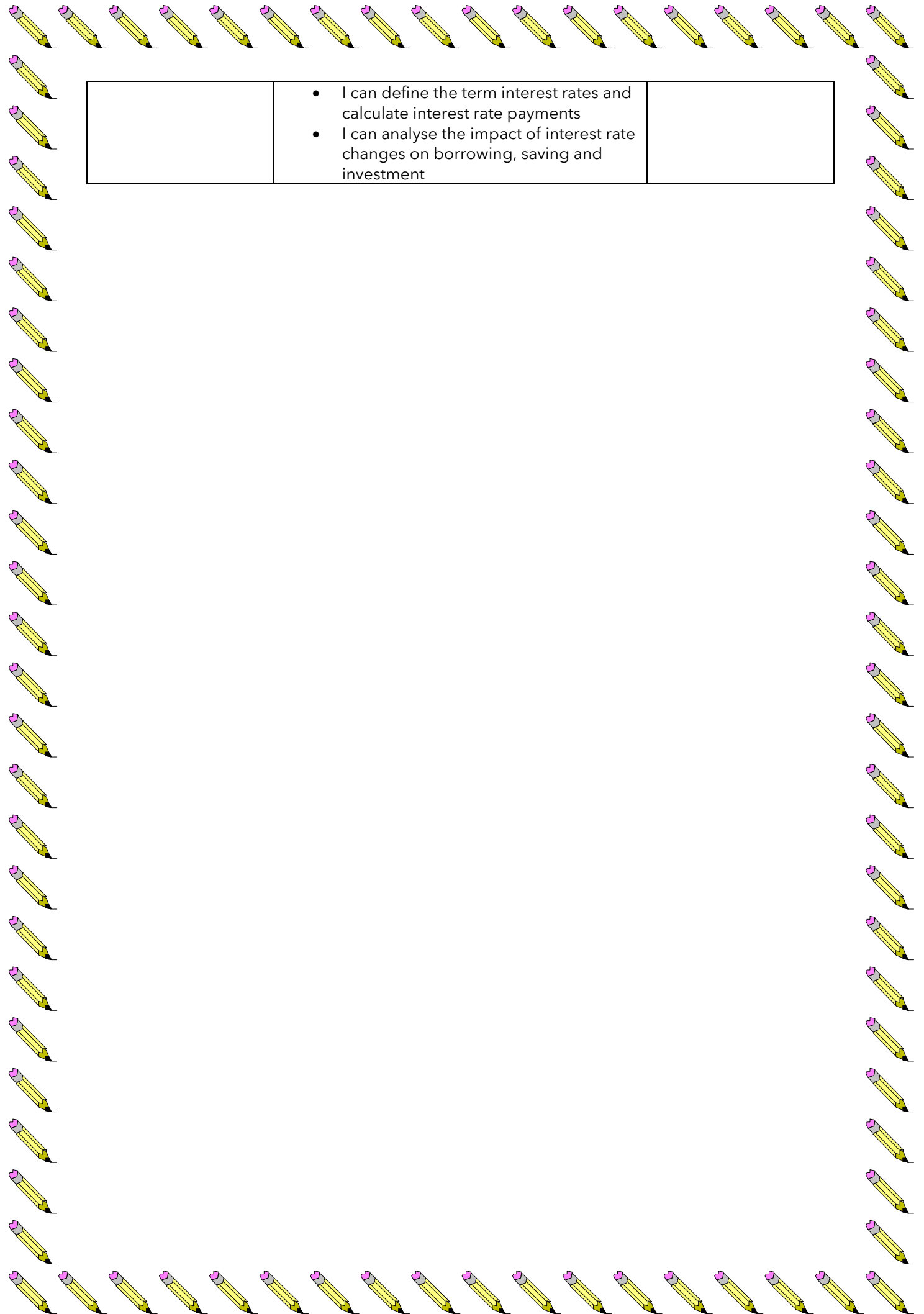
Section B – 3 case studies (each has 20 total marks – a combination of 2 and 6 markers)

**This is the same for both papers!**

<b>Unit 1: Introduction to Economics</b>		<b>Pages in revision guide</b>
<b>1: Main Economic Groups and Factors of Production</b>	<ul style="list-style-type: none"> <li>I can identify and explain the role of consumers, producers and the government</li> <li>I can explain how the economic groups are interdependent</li> <li>I can identify and give examples of the four factors of production (CELL)</li> </ul>	Pages 10 - 12
<b>2: The Basic Economic Problem</b>	<ul style="list-style-type: none"> <li>I can define the basic economic problem and identify the three fundamental questions of Microeconomics</li> <li>I can define opportunity cost and give real world examples</li> </ul>	Pages 13 - 16
<b>Unit 2: The Role of Markets and Money</b>		
<b>1: The Role of Markets</b>	<ul style="list-style-type: none"> <li>I can define and give examples of markets</li> <li>I can explain the difference between the product and factor markets</li> <li>I can define and give examples of firms in primary, secondary and tertiary sectors</li> <li>I can define exchange and specialisation</li> <li>I can evaluate the costs and benefits of specialisation to workers, firms, regions and economies</li> </ul>	Pages 17 - 20
<b>2a: Demand</b>	<ul style="list-style-type: none"> <li>I can define demand</li> <li>I can draw demand curves and show extensions and contractions of demand</li> <li>I can draw shifts of demand and identify factors that shift demand curves (PIRATES L)</li> </ul>	Pages 21 - 24
<b>2b: Price elasticity of demand</b>	<ul style="list-style-type: none"> <li>I can define price elasticity of demand</li> <li>I can draw demand curves with different PEDs</li> <li>I can calculate and interpret PED values</li> <li>I can evaluate the importance of price elasticity of demand to consumers and firms</li> </ul>	Pages 25 - 27
<b>3a: Supply</b>	<ul style="list-style-type: none"> <li>I can define supply</li> <li>I can draw supply curves and show extensions and contractions of supply</li> <li>I can draw shifts of demand and identify factors that shift supply curves (PINTS WC)</li> </ul>	Pages 28 - 31
<b>3b: Price Elasticity of Supply</b>	<ul style="list-style-type: none"> <li>I can define price elasticity of supply</li> <li>I can draw supply curves with different PESs</li> <li>I can calculate and interpret PES values</li> </ul>	Pages 32 - 35



	<ul style="list-style-type: none"> <li>I can evaluate the importance of price elasticity of supply to consumers and firms</li> </ul>	
<b>4: Prices</b>	<ul style="list-style-type: none"> <li>I can explain the difference between price and worth</li> <li>I can identify the functions of the price mechanism (SIRA)</li> <li>I can explain how markets will use the price mechanism to eliminate excess supply/demand, using diagrams</li> <li>I can analyse the causes of supply and demand shifts</li> <li>I can analyse the consequences of supply and demand shifts</li> </ul>	Pages 36 - 41
<b>5: Competition</b>	<ul style="list-style-type: none"> <li>I can define competition and explain how and why firms compete in markets</li> <li>I can analyse the impact of competition on price and quantity</li> <li>I can evaluate the impact of competition on consumers and firms</li> <li>I can identify features of monopoly, oligopoly and perfectly competitive markets</li> </ul>	Pages 42 - 45
<b>6: Production</b>	<ul style="list-style-type: none"> <li>I can define production and explain how individuals, firms and governments can be producers</li> <li>I can evaluate the importance of production and productivity</li> <li>I can define and calculate total revenue, average revenue, fixed costs, variable cost, total cost, average cost, profit and loss</li> <li>I can evaluate the importance of costs, revenue and profit to firms</li> <li>I can define and give examples of economies and diseconomies of scale</li> </ul>	Pages 46 - 51
<b>7: The Labour Market</b>	<ul style="list-style-type: none"> <li>I can define the term 'labour market' and explain why labour is a derived demand</li> <li>I can explain the interaction between employees and employers</li> <li>I can analyse how wages are determined through supply and demand, using diagrams</li> <li>I can calculate gross and net pay, giving examples of deductions.</li> </ul>	Pages 52 - 57
<b>8: Role of money and financial markets</b>	<ul style="list-style-type: none"> <li>I can explain money as a medium of exchange</li> <li>I can define the term financial sector and explain the roles of central, commercial banks, insurance companies and building societies</li> <li>I can evaluate the importance of the financial sector to households, firms and government</li> </ul>	Pages 58 - 63



	<ul style="list-style-type: none"><li>• I can define the term interest rates and calculate interest rate payments</li><li>• I can analyse the impact of interest rate changes on borrowing, saving and investment</li></ul>	
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# Business

Day	<b>Business in the Real World</b>	Page in RG	BBC Bitesize link	Tick
	The Purpose and nature of a business			
1	I know what a business is and the reasons for starting a business	1	<a href="#">The Purpose and nature of starting a business</a>	
2	I can explain the difference between goods and services and give business examples, needs and wants and examples	1	<a href="#">The Purpose and nature of starting a business</a>	
3	I can identify the four factors of production - land labour capital and enterprise (CELL)	4	<a href="#">Factors of production</a>	
4	I can explain the term opportunity cost	4	<a href="#">Opportunity cost</a>	
5	I can define the three sectors; primary secondary and tertiary and give examples of types of businesses in each sector	1	<a href="#">Business sectors</a>	
6	I understand what is meant by the term enterprise and what is meant by an entrepreneur	3	<a href="#">Enterprise and Entrepreneurship</a>	
7	I can explain characteristics and entrepreneur will possess such as hard working, innovative organised and willing to take a risk	3	<a href="#">Enterprise and Entrepreneurship</a>	
8	I can explain the objectives of an entrepreneur for starting a business including; be their own boss, flexible working hours, to pursue an interest, earn money, identify a gap in the market and dissatisfaction with current job	3	<a href="#">Enterprise and Entrepreneurship</a>	
9	I can list some changes (dynamic nature) that businesses face e.g changes in technology, economic situation. Legislation and environment	4	<a href="#">Dynamic nature</a>	

1.2 Business ownership			
9	<p>I can define what a sole trader is and identify what type of businesses would use this ownership</p> <p>I give at least two advantage and two disadvantages of a sole trader ownership</p> <p>I understand who controls and manages a sole trader</p> <p>I know how the profits are shared in a sole trader ownership</p> <p>I know how a sole trader can raise finance to start the business e.g loan, own capital</p> <p>I know what type of liability a sole trader has</p>	5	<a href="#">Sole traders</a>
10	<p>I can define what a partnership is and identify what type of businesses would use this ownership</p> <p>I give at least two advantage and two disadvantages of a partnership ownership</p> <p>I understand who controls and manages a partnership</p> <p>I know how a partnership can raise finance to start the business e.g loan, partners capital</p> <p>I know what type of liability a partnership has</p>	5	<a href="#">Partnerships</a>
11	<p>I can define what a private limited company (Ltd) is and identify what type of businesses would use this ownership</p> <p>I give at least two advantage and two disadvantages of private limited company ownership</p> <p>I understand who controls and manages a private limited company</p> <p>I know how the profits are shared in a private limited company ownership</p> <p>I know how a private limited company can raise finance to start the business e.g selling shares privately</p> <p>I know what type of liability a private limited company has</p>	6	<a href="#">Private Limited Companies</a>
12	<p>I can define what a public limited company (plc) is and identify what type of businesses would use this ownership</p> <p>I give at least two advantage and two disadvantages of public company ownership</p> <p>I understand who controls and manages a public limited company</p>	6	<a href="#">Public limited companies</a>

	<p>I know how the profits are shared in a public limited company ownership</p> <p>I know how a public limited company can raise finance to start the business e.g selling shares publicly on the stock exchange</p> <p>I know how a public limited company can raise finance to start the business e.g selling shares publicly on the stock exchange</p> <p>I know what type of liability a public limited company has</p>			
13	<p>I can define what a not-for-profit organisation is (social enterprise)</p> <p>I can explain how a not-for-profit organisation has different objectives to other businesses</p>	7	<a href="#">Non-Profit organisation</a>	
1.3 Business objectives				
14	<p>I can list and explain the main aims of a business; survival, profit maximisation, growth, market share, customer satisfaction, social and ethical objectives, shareholder value</p> <p>I can explain the role objectives have in a business</p> <p>I understand why an evolving business will set different objectives compared to a start-up business</p> <p>I understand that the success of a business can be measured in other ways than profit</p>	8&9	<a href="#">Setting aims and objectives pages 1-4</a>	
1.4 Stakeholders				
15	<p>I can define the term stakeholder</p> <p>I know examples of stakeholders; owners, employees, customers, local community and suppliers</p> <p>I know the objectives for the following stakeholders; owners, employees and customers</p> <p>I understand how a business can affect the local community negatively and positively</p> <p>I understand how some stakeholders may conflict because they have different objectives from what they want from a business</p>	10	<a href="#">Business stakeholders' pages 1-5</a>	
1.5 Business Location				
16	<p>I understand the factors that affect a business decision to choose a location, such</p>	13	<a href="#">Business location pages 1-3</a>	

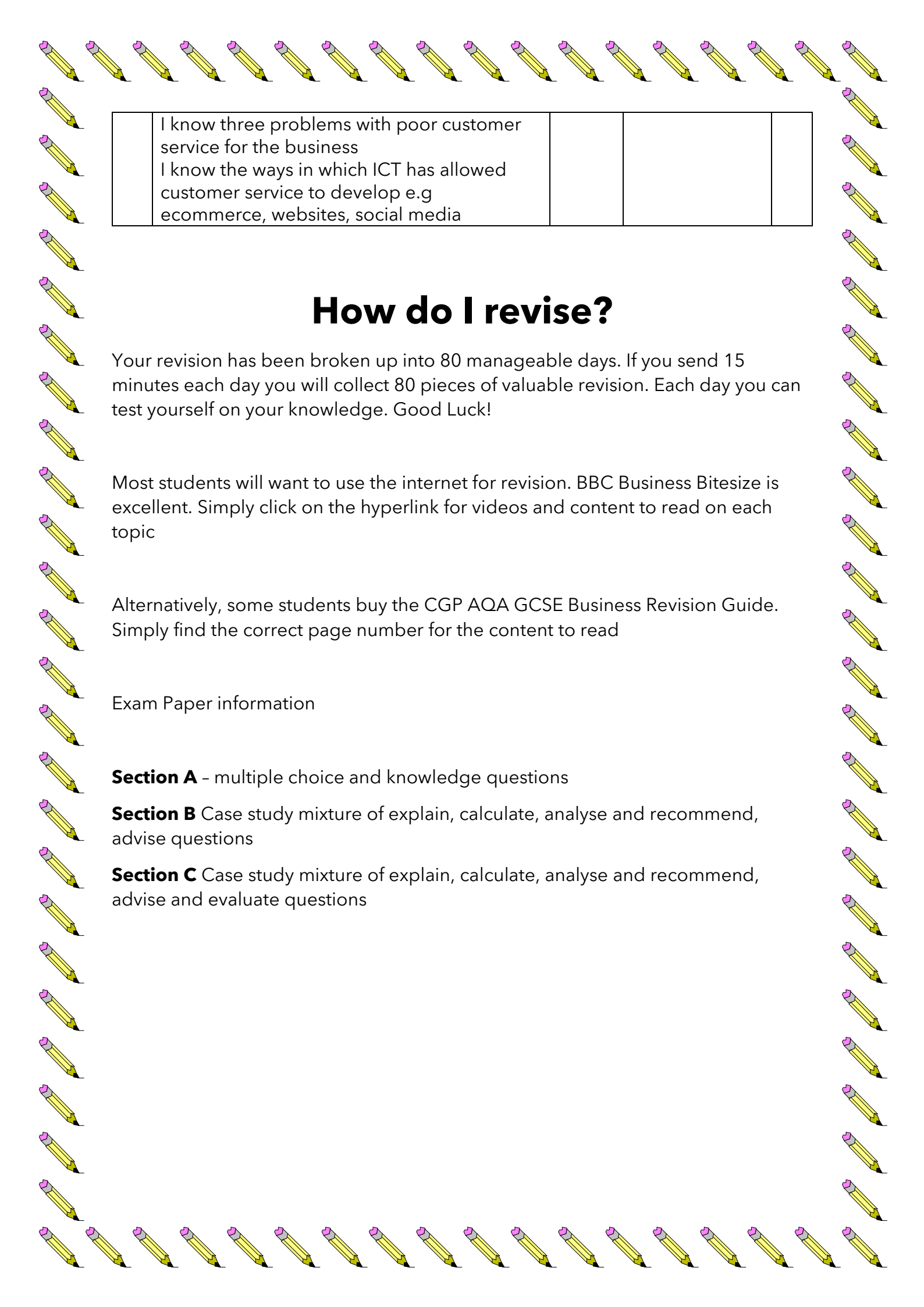
	as; proximity to market, availability of raw materials, labour, competition and costs			
<b>1.6 Business planning</b>				
17	I can explain what a business plan is I can name the sections on a business plan I can explain the reasons why a business produces a business plan; setting up a new business, raising finance, setting objectives and detailing how functions of a business will be organised I can explain two benefits and drawbacks of producing a business plan	12	<a href="#">Business planning page 1&amp;2</a>	
18	I can define what a variable cost is and give examples I can define what a fixed cost is and give examples I can calculate revenue (selling price x units sold) I can calculate profit (Revenue - fixed costs and variable costs)	11	<a href="#">Basic finance calculations</a>	
<b>1.7 Expanding a business</b>				
19	I can explain the ways a business can grow; organic growth, franchising, outsourcing, merger/takeovers, e-commerce I can explain one advantage and disadvantage of the above growth methods	14 & 15	<a href="#">Expanding a business pages 4&amp;5</a>	
20	I know what economies of scale means I understand how a large business has cost advantages over a small business I know what purchasing and technical economies of scale mean	14 & 15	<a href="#">Economies of scale</a>	
21	I know what diseconomies of scale mean I understand how growth can cause problems with communication, coordination and staff motivation	14 & 15	<a href="#">Diseconomies of scale</a>	
22	I can calculate and interpret average unit costs	14 & 15	<a href="#">Calculating average unit costs</a>	
<b>2. Influences on businesses</b>				
<b>2.1 Technology</b>				
23	I understand how changes in ICT influence business activity	21	<a href="#">Changes in ICT pages 1-7</a>	
24	I understand how e-commerce allows access to wider markets	21	<a href="#">E-commerce</a>	



25	I can identify ways digital technology can be uses to communicate with different stakeholders	21	<a href="#">Digital technology pages 1-7</a>	
2.2 Ethical and environmental considerations				
26	I can analyse where there maybe a possible trade-off between ethics and profit	22	<a href="#">Ethics vs profit</a>	
27	I know relevant examples in ways business behave ethically and the benefits and drawbacks of ethical behaviour	22	<a href="#">Ethics</a>	
28	I understand how businesses and consumers accept greater environmental responsibility. What is sustainability	23	<a href="#">Environment</a>	
2.3 The economic climate				
29	I understand how businesses might be affected by a change in interest rates	24&25	<a href="#">Interest rates</a>	
30	I understand how businesses might be affected by changes in levels of employment	24&25	<a href="#">Unemployment</a>	
31	I understand how demand for products and services change as incomes fluctuate	24&25	<a href="#">Changes in income</a>	
2.4 Globalisation				
32	I understand the benefits and drawbacks of globalisation for businesses	27	<a href="#">Globalisation pages 1 and 4</a>	
33	I know the impact of exchange rates on the profit and sales of businesses that import and export	28	<a href="#">Imports, exports and ER 2,3</a>	
2.5 Legislation				
34	I know the following laws; national living wage/minimum wage, equality act, health and safety, consumer law I understand how legislation affects, costs, training, recruitment and failure to meet legislation	19&20	<a href="#">Legislation pages 1-8</a>	
2.6 Competitive environment				
35	I know what is meant by a market and competition I can analyse the impacts of competition on businesses I understand the risk businesses face	26	<a href="#">Competitive market pages 1 and 2</a>	
3 Business Operations				
3.1 Production processes				



36	I know the following production methods and the advantages and disadvantages of each method; job and flow production	34	<a href="#">Job and flow</a>	
37	I understand how production can be made more efficient through using lean production and just-in-time (JIT)	35	<a href="#">Lean and efficiency</a> <a href="#">Just in Time</a>	
3.2 The role of procurement				
38	I can explain the advantages and disadvantages for managing stock through Just in Time and Just in case methods I understand the benefits of having buffer stocks I understand the benefits of purchasing economies of scale	32	<a href="#">JIT</a> <a href="#">JIC</a>	
39	I can analyse the factors that affect the choice of supplier for a given business e.g price, reliability, quality	33	<a href="#">Supplier choice</a>	
40	I understand what procurement and logistics means I can give reasons how effective procurement and logistics can benefit a business I understand how businesses managing the supply chain. e.g working with suppliers, cost effective, getting best price and value, cutting any unnecessary waste	33	<a href="#">Procurement and logistics</a> <a href="#">Effective management of supply chains</a>	
3.3 Concept of quality				
41	I can identify the consequences of poor quality I can identify ways a business measure quality and manage quality (quality control) I can define what Total Quality Management is (TQM) I am aware of the possible quality issues businesses face as they grow e.g; additional sales, image/reputation, higher price, inspection costs, staff training, product recalls, the provision of services	36&37	<a href="#">Quality pages 1-4</a>	
3.4 Good customer services				
42	I understand the sales process e.g product knowledge, customer engagement, post sales services (help lines, user training, servicing) I know four benefits of good customer service for the business	38&39	<a href="#">Customer service pages 1-4</a>	



I know three problems with poor customer service for the business			
I know the ways in which ICT has allowed customer service to develop e.g ecommerce, websites, social media			

## How do I revise?

Your revision has been broken up into 80 manageable days. If you spend 15 minutes each day you will collect 80 pieces of valuable revision. Each day you can test yourself on your knowledge. Good Luck!

Most students will want to use the internet for revision. BBC Business Bitesize is excellent. Simply click on the hyperlink for videos and content to read on each topic

Alternatively, some students buy the CGP AQA GCSE Business Revision Guide. Simply find the correct page number for the content to read

Exam Paper information

**Section A** - multiple choice and knowledge questions

**Section B** Case study mixture of explain, calculate, analyse and recommend, advise questions

**Section C** Case study mixture of explain, calculate, analyse and recommend, advise and evaluate questions

# Astronomy

## Naked Eye - Paper 1

Unit	Topic	Revised?
Planet Earth	<ul style="list-style-type: none"> <li>▪ Shape and size of the Earth</li> <li>▪ The Earth's major internal divisions</li> <li>▪ The Earth's atmosphere:               <ul style="list-style-type: none"> <li>✦ Its role in supporting life</li> <li>✦ Its impact on astronomical observations.</li> </ul> </li> <li>▪ ✦ Sky colour, skyglow and twinkling of stars.</li> <li>▪ Latitude and longitude system</li> <li>Major divisions of the Earth's surface and their astronomical significance:               <ul style="list-style-type: none"> <li>✦ Equator</li> <li>✦ Tropics</li> <li>✦ Polar circles</li> <li>✦ Prime meridian</li> </ul> </li> </ul>	
Celestial Observation	<ul style="list-style-type: none"> <li>▪ Recognise various astronomical phenomena visible to the naked eye.</li> <li>▪ Recognise and draw various constellations and asterisms.</li> <li>▪ Use asterisms as pointers to locate other objects in the night sky.</li> <li>▪ Know why different cultures have different names for constellations</li> <li>Know and use right ascension and declination / altitude and azimuth. Use star charts and planispheres, and know their advantages and disadvantages.</li> <li>Calculate a star's hour angle or LST based on right ascension</li> <li>Know the daily motion of the night sky including changes to rising and setting times.</li> <li>▪ Determine whether a star is circumpolar and calculate upper and lower transit.</li> </ul>	
Lunar Disc	<ul style="list-style-type: none"> <li>▪ Know the shape and size of the Moon</li> <li>▪ Recognise different lunar features and how they were created. Be able to identify major lunar mare, craters and mountains on the Moon.</li> <li>▪</li> </ul>	

	<p>Use the length of the Moon rotational period (27.3 days) and its orbital period (29.5 days)</p> <ul style="list-style-type: none"> <li>Understand the causes of lunar libration and its effect on the visibility of the Moon.</li> </ul>	
Solar System Observation	<ul style="list-style-type: none"> <li>Know how to construct and safely use a pinhole projection to observe eclipses.</li> <li>Know the changing position of planets along zodiacal band, the cause of retrograde motion</li> <li>Know the significance of the First Point of Aries and the ecliptic.</li> <li>Understand the appearance of and cause of meteor showers. Know when the best time to observe inferior and superior planets are.</li> <li>Know what a transit and an occultation is.</li> </ul>	
Earth-Moon-Sun System	<ul style="list-style-type: none"> <li>Be able to use information about the relative distances between and relative sizes of Earth Moon and Sun.</li> <li>Understand how the Moon causes tides and the effect of the Sun and Moon on neap and spring tides.</li> <li>Understand what precession is and its use in dating in archaeoastronomy.</li> <li>Understand the appearance of the Sun during the different types of solar eclipses - including terms such as umbral contact.</li> <li>Know how the umbra and penumbra of the Moon causes the eclipse to vary in appearance.</li> <li>Know the appearance of the Moon in lunar eclipses.</li> <li>Understand and describe the work of Eratosthenes and Aristarchus on: <ul style="list-style-type: none"> <li>Diameter of the Earth</li> <li>Diameter of the Moon</li> <li>Distance to the Moon</li> <li>Distance to the Sun</li> <li>Diameter of the Sun</li> </ul> </li> </ul>	

# Telescopic - Paper 2

Unit	Topic	Revised?
Exploring the Moon	<ul style="list-style-type: none"> <li>▪ Understand the Moon major internal divisions</li> <li>▪ Understand the differences between the appearance of the near and far side of the Moon</li> <li>▪ Understand the different theories for the Moon's origin.</li> <li>▪ Understand the main aims and the scientific aims of the Apollo programme</li> </ul>	
Exploring the Solar System	<ul style="list-style-type: none"> <li>▪ Know the names and locations of the various bodies in the Solar System</li> <li>▪ Understand the nature and structure of comets, including their likely places of origin</li> <li>▪ Know the principal characteristics of the different planets in the solar system including atmosphere, temperature, ring systems, moons. Understand the main theory for the formation of the solar system and the formation and position of the gas giants.</li> <li>▪ Understand the structure and origin of meteoroids and meteorites.</li> <li>▪ Understand the main theories for the origin of water on Earth Know the limits of the human eye on observations Understand the main components of telescopes.</li> <li>▪ Know the basic design of Galilean refractors, Keplerian refractors, Newtonian reflectors and Schmidt-Cassegrain reflectors.</li> <li>Know that light grasp is directly proportional to the square of the diameter of the objective or to its area.</li> <li>▪ Know what field of view is.</li> <li>▪ Calculate the magnification of a telescope set up.</li> <li>▪ Know the advantages of the reflectors over refractors</li> <li>▪ Know the advantages and disadvantages of different types of space probe.</li> </ul>	



# Biology

T1 - 5

H1 - 4



## **Cell Biology**

Cell structure - Eukaryotes and prokaryotes

Animal and plant cells

Cell specialisation

Cell differentiation

Stem cells

Diffusion

Osmosis

Active transport

## **Organisation**

Principles of organisation

The heart and blood vessels

Blood

Coronary heart disease: a non-communicable disease

Health issues

The effect of lifestyle on some non-communicable diseases

Cancer

Plant tissues

Plant organ system

## **Infection and Response**

Detection and identification of plant diseases

Plant defence responses

## **Bioenergetics**

Photosynthesis - reaction

Rate of photosynthesis

Uses of glucose from photosynthesis

Aerobic and anaerobic respiration

Response to exercise

Metabolism





# Biology

## H5

## S1



**Cell Biology**

Cell structure - Eukaryotes and prokaryotes

Animal and plant cells

Cell specialisation

Cell differentiation

Microscopy

Cell division - Chromosomes

Mitosis and the cell cycle

Stem cells

Diffusion

Osmosis

Active transport

**Organisation**

Principles of organisation

Plant tissues

Plant organ system

**Bioenergetics**

Photosynthesis - reaction

Rate of photosynthesis

Uses of glucose from photosynthesis

Aerobic and anaerobic respiration

Response to exercise

Metabolism



# Religion, Philosophy & Ethics

## Paper 1: Study of Religions

	Confident	Somewhat confident	Not confident
<b>Christianity: Beliefs &amp; Teachings</b>			
The Nature of God			
The Trinity: Father, Son & Holy Spirit			
Different Christian beliefs about Creation: Creationism vs. Liberal views			
The Fall of Man & Original Sin			
The Problem of Evil			
The Incarnation and Jesus as the Son of God			
The Crucifixion of Jesus: Why did Jesus have to die?			
The Resurrection and Ascension of Jesus			
Means of Salvation - Law, Grace and Spirit			
The role of Christ in Salvation (Atonement)			
Christian beliefs about Judgement - General & Particular Judgement			
Christian beliefs on the Afterlife - resurrection, Heaven and Hell			



**Paper 2: Thematic Studies**

<b>Relationships and Families</b>	<b>Confident</b>	<b>Somewhat confident</b>	<b>Not confident</b>
Contraception (including religious attitudes)			
Religious attitudes to Sex before Marriage			
Human Sexuality: Heterosexual and Homosexual relationships (including religious attitudes)			
The nature and purpose of Marriage			
Cohabitation (including religious attitudes)			
Religious attitudes to Same-sex Marriage			
Divorce and Remarriage (including religious attitudes)			
The Nature of Families: The role of Parents & Children			
Different types of Families: Nuclear & Extended Families			
The Purpose of Families: Procreation, stability, educating children in a faith			
Family Issues: Polygamy			
The Roles of Men and Women			
Gender Equality (including examples of prejudice & discrimination)			



# Maths

# Foundation

Please remember that you have not yet completed the course and so some topics will come up that you have not been taught yet. You will not be expected to know these. You should prioritise your revision time on topics you have been taught.

<b>Topic</b>	<b>Sparx</b>	<b>RAG</b>
Time	U902	
Negative Numbers	U742	
Prime Numbers	U236	
Lowest Common Multiple	U751	
Fractions, Decimals, Percentages (Converting/Ordering)	U594, U478, U293, U888, U922	
Fraction Operations	U881, U736, U544, U916	
Percentage Problems (including Multipliers)	U925, U773, U349	
Powers, Roots, Index Laws	U851, U235	
Converting Currency	U610	
Unit Conversions	U388	
Simplifying and using Ratios	U687, U753	
Share in a Ratio	U577	
Direct Proportion (including Best Buy)	U721	
Inverse Proportion	U364	
Scale Diagrams	U257	
Substitution	U201	
Simplifying Expressions (including Collecting Like Terms)	U105, U613, U870, U325, U599, U755, M428	
Forming and Solving Linear Equations	U145, U337	
Solving Linear Inequalities	U741, U848	
Straight Line Graphs (Plotting/Interpreting/Gradient)	U213, U680, U530	
Sequences	U408, U683	
Single Event Probability	U580	
Experimental Probability	U280	
Frequency Trees	U476	
Venn Diagrams	U981,	
Two-way Tables	U312, U854	
Averages from Frequency Tables and other Diagrams	U277, U128	
Scatter Diagrams	U447, U730, U390, U628	
Angle Rules	U151, U910	
DMV, SDT	U993, U424, U343	
Area and Perimeter of 2D shapes (Including Compound)	U719	
3D Shapes	U604	
Circumference of a Circle	U519	
Transformations	U632, U564, U903	
Vectors	U283, U627	
Exact Values Trigonometry		



# Maths

# Higher

Please remember that you have not yet completed the course and so some topics will come up that you have not been taught yet. You will not be expected to know these. You should prioritise your revision time on topics you have been taught.



<b>Topic</b>	<b>Sparx</b>	<b>RAG</b>
FDP	U888, U478, M701	
Fraction Operations	U475, U736, U544, U881, U692, U349	
Percentages	U773, U988	
Standard Form	U534	
Powers, Roots and Index Laws	U851, U235, U694, U772	
Surds	U633, U707	
Error Intervals	U587	
Writing and Simplifying Ratios	U687, U921	
Sharing in a Ratio	U577, U753	
Inverse Proportion	U138	
Simplifying Expressions	U613, U105	
Expanding Brackets (single and double)	U179, U768	
Forming and Solving Linear Equations	U755, U325	
Solving Linear Inequalities	U145	
Solving Quadratic Equations	U228	
Solving Quadratic Inequalities	U133, U509	
Algebraic Fractions	U685	
Changing the Subject	U556	
Converting Recurring Decimals to Fractions	U689	
Plotting Graphs, Equation of a Line	U741, U848	
Equations of Circles and Tangents	U567	
Real Life Graphs	U193, U800	
Graph Transformations	U487, U598	
Experimental Probability	U580	
Independent and Conditional Probability (including Probability Tree Diagrams)	U683, U558, U729	
Venn Diagrams	U476	
Averages from Frequency Tables	U312, U291	
Cumulative Frequency	U182, U642	
Circumference of a Circle	U604	
DMV, SDT	U151, U910	
Volume of 3D Shapes	U543	
Trigonometry (Exact Values, Area of a Triangle)	U592, U627	
Circle Theorems	U808	
Transformations	U766, U196, U134	
Vectors	U632, U564, U903	

# Geography

## Checklist for Human paper

Do I know...	Red	Amber	Green
<b>Urban issues and challenges - London</b>			
-The global pattern of urban change			
-Rates of urbanisation in HICs and LICs			
-Factors effect rates of urbanisation (R-U migration and natural increase)			
-Mega cities			
-Overview of population and major cities in the UK			
-London: location and importance			
-London: Impact of migration on the character			
-London: Urban change creating opportunities - cultural mix, recreation, employment, integrated transport			
-London: Urban greening			
-London: Challenge - urban deprivation, inequalities in housing, education, health and employment			
-London: dereliction, brownfield, greenfield and waste disposal			
-London: Impact of urban sprawl on the rural-urban fringe and commuter settlements			
-London: Urban regeneration (Olympics) - why it was needed and the main features of it			
<b>Changing economic world</b>			
-Definition of HICs, LIC and NEE			
-UK - The causes of economic change - deindustrialisation and the decline of traditional industries, globalisation and government policies			
-UK - what is a post-industrial economy and its features e.g. development of IT, services, finance, research and science and business parks			
-UK - The impact of industry on the environment			
-UK - Nissan - how is Nissan environmentally sustainable			
-UK - the social and economic impacts of population change in South Cambridgeshire (population increase) and the Outer Hebrides (population decline)			

-UK- Improvements to road, airports, trains and ports			
-UK - The attempts to reduce regional differences (the North South divide)			
-UK-the UK's place in the wider world with trade, culture, transport and electronic communications (EU and Commonwealth)			

# Revision Guide for Human Paper

## Section A: Urban Issues and Challenges

**The growing percentage of the world's population lives in urban areas**

**The global pattern of urban change:**

- →High Income Countries are more economically developed e.g. UK.
- →Urbanisation has happened here years ago during the industrial revolution so most people tend to live in urban areas.
- Low Income Countries are less economically developed e.g. Nepal and not many live in urban areas. **Therefore the fastest rates of urbanisation are in LICs.**
- Newly Emerging Economies are where economic development is increasing rapidly e.g. Brazil. Therefore urban growth is high here.

**Why is this?**

Richer countries - Rural to cities where urbanisation occurred in 18<sup>th</sup> and 19<sup>th</sup> Centuries when industrial and agricultural revolutions meant that machinery replaced farm labour.

More jobs were created in new factories in urban areas and people moved from farms to towns for work. In the late 20<sup>th</sup> Century people left run down inner city areas and moved to the country.

**You are likely to get a graph question for this - please remember the magic formula!:**

**Pattern** - Is the trend increasing/decreasing/fluctuating?

**Data and Description** - Describe the trend is it rapidly, slowly? Then do some Maths e.g. in 1980 the amount of ice creams sold = 10 million, but in 2000 = 20 million. This is a difference of 10 million.

**Anomaly** : What doesn't fit the trend/data e.g. if the line was rising steadily then suddenly decreases this would be an anomaly.

**Factors affecting the rate of urbanisation:**

**Key words:**

**Urban sprawl/growth** = Unplanned growth of urban areas which spread into rural areas

**Urbanisation** = "is the increase in the proportion (%) of people living in urban (towns and cities) areas and a decrease in those living in rural (countryside) areas"

**This is caused by**

- 1. Rural-urban migration** = When people move from the countryside to the city due to **push** (war, drought, lack of food and poor healthcare) and **pull** factors (better healthcare, better education and more job opportunities).
- 2. Natural Increase** = More people having more babies. More babies are born in cities and more will move to cities.

**The emergence of megacities (a city with more than 10 million people in it):**

- There are currently 34 megacities.
- More than 2/3 of these are in LICs and NEEs.
- E.G. LA, Tokyo
- **THEY GROW BECAUSE OF RURAL-URBAN MIGRATION AND NATURAL INCREASE.**

**Urban change in cities in the UK leads to a variety of social, economic and environmental opportunities and challenges.**

**A CASE STUDY OF A MAJOR CITY IN THE UK = LONDON - Located in SE of UK**

**An overview of major cities in the UK:**



UPLAND REGIONS =  
SCOTLAND = SPARSE AS FEW  
NATURAL RESOURCES

LONDON = NATIONAL  
CAPITAL

LOWLAND AREAS =  
BIRMINGHAM = EASY TO  
BUILD ON

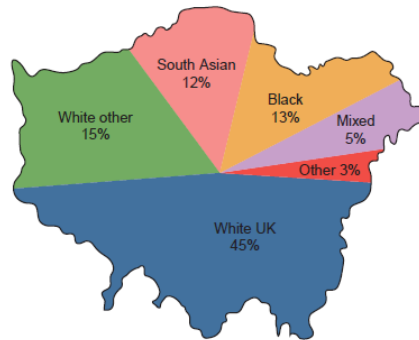
\*Lots of people live in London  
and Birmingham and other  
cities e.g. Leeds. Less live in  
places e.g. small towns in  
Scotland

**The importance of London as city in the UK and in the wider world:**

- It is the UK's main transport hub
- It is home to the BBC
- There are lots of job available here in government and finance
- Great Ormond Street Hospital is located here
- Lots of companies, both British and foreign, have their headquarters.
- Los of legal work is done here e.g. at the Old Bailey
- Lots of tourists visit the city.

**Impacts of national and international migration on the growth and character of the city**

- Today, London's population comes from every part of the world. The largest numbers are from countries like Nigeria and Jamaica (each were once part of the British Empire). Since 2007, more migrants have come from Eastern Europe.



**Positives and negatives of migration in London:**

☺ To see attractions like St Paul's cathedral Lots of different foods Cultural diversity	☹ Racism Low paid jobs due to limited speaking of English Language barriers
---	--

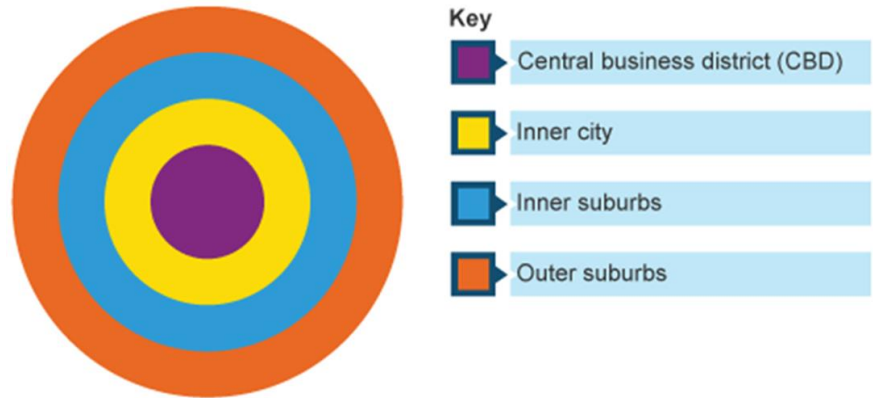
**Urban change has led to opportunities in London:**

- ☺ Lots of festivals to celebrate cultural diversity and recreational entertainment e.g. Notting Hill
- ☺ Example of social and cultural + employment = Shoreditch - high tech companies have located on Silicon Roundabout which are high paid jobs. The area has been regenerated and old factories turned into new pubs, there is street art and housing for £330/week
- ☺ Integrated transport systems improving = Cross Rail is being developed to bring an extra 200 million journeys, less Co2, 1.5 million within a 45min journey and properties along the network will rise by 25%



© Urban greening (creating more green space in cities) = 47% of land in London is green space. There are 8.1 million trees, 13,000 species live here, 30,000 allotments and room to exercise in the parks.

**Environmental challenges caused by urban growth in London:**



- Despite regeneration urban areas in the inner city e.g. the London Docklands, house prices in London are growing faster than anywhere else. This puts pressure on the RURAL URBAN FRINGE and population pressure too. This = URBAN SPRAWL.
- This puts pressure on wildlife and ecosystems can be damaged/destroyed.
- However, people get better facilities e.g. new shopping centres on the RUF.
- Houses are starting to spread outside of London into areas e.g. Luton. This is creating commuter villages

**Challenges in commuter villages:**

A commuter village are places in the rural/urban fringe where the majority of the population leaves the town each day to work in the city e.g. Luton to London.

**This causes problems:**

- New houses change the old character of the towns
- Demand for houses increases house prices for the locals
- Businesses in commuter settlements may suffer as people go back to the city to work.
- Large numbers of commuters can increase pollution

***\*To cope with the huge amount of urban sprawl in London, there has been a move to building on greenfield and brownfield sites\****

<b><u>GREENFIELD SITES - Never been built upon</u></b>	<b><u>BROWNFIELD SITES -once had buildings on it</u></b>
☺Land is cheap to build on as no demolition is needed	☺It stops dereliction from happening which can lead to crime
☺Land is more expensive to buy as it has not been built on previously	☺Existing buildings can be split up to make many houses
☺Some land is defined as 'greenbelt'. This land cannot be built upon. This land was	☺The site has already been developed so reduces urban sprawl

established in 1947 and it preserves areas of farmland and woodland	
☹️Environmentalists protest about build in greenfield sites as it encourages urban sprawl	☹️More land is available in the North and the Midlands (but houses needed in the South East)
☹️Loss of the countryside	☹️Redevelop the area to make it look more attractive
☹️Could encourage more traffic and pollution	☹️Land could be contaminated as industry was once located there
☹️Easier to access	☹️Land is cheap to buy
☹️Can be more pleasant to live in as they are on the edge of town and cities	☹️Land can be expensive to clear and build upon because of the previous industry left on it
☹️Public transport is worse in rural areas so more need for cars = air pollution	☹️Lots of sites are available due to deindustrialisation
☹️Once the land has been built upon, it is unlikely to ever go back to countryside	☹️Public transport is better in the urban areas so less need for cars
☹️Valuable farm land, habitats or recreation land is lost	☹️Land is more expensive in the urban areas of London

### **Environmental challenges caused by urban growth in London: Waste management**

#### **LANDFILL SITES:**

24% of London's waste goes into landfill sites. This might be good because it is out of site, but it produces methane that contributes to greenhouse gases in the atmosphere.

#### **RECYCLING:**

61% of London's waste is recycled into glass, paper and food waste. The government has a target of zero waste going into landfill by 2030.

#### **INCINERATION:**

London sometimes burns its waste in order to generate electricity.

### **Social and economic challenges caused by urban growth in London**

#### **Key terms:**

**Social deprivation** = The degree to which a person or a community lacks the things that are essential for a decent life, including work, money housing and services

**Poverty** = the state of being extremely poor

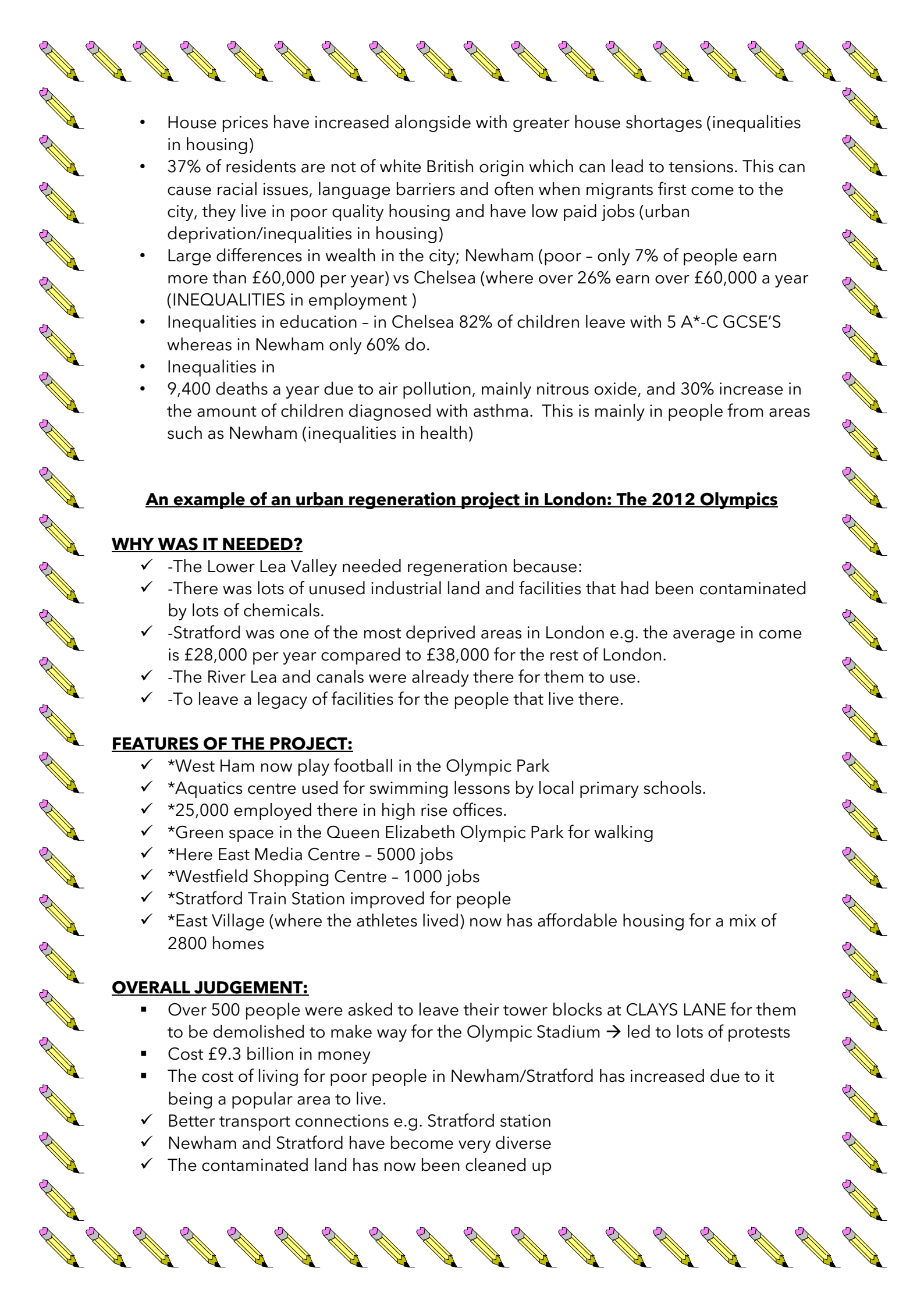
**Life expectancy** = The average age that a person is expected to live.

**Inequalities** = The difference between poverty and wealth as well as peoples 'well being and access to thing like jobs and education

#### **Social and economic challenges in London caused by urban change:**

- High urban deprivation e.g. Life expectancy in Knightsbridge is 90, whereas it is 78 in West Ham (this also shows healthcare)



- 
- House prices have increased alongside with greater house shortages (inequalities in housing)
  - 37% of residents are not of white British origin which can lead to tensions. This can cause racial issues, language barriers and often when migrants first come to the city, they live in poor quality housing and have low paid jobs (urban deprivation/inequalities in housing)
  - Large differences in wealth in the city; Newham (poor - only 7% of people earn more than £60,000 per year) vs Chelsea (where over 26% earn over £60,000 a year (INEQUALITIES in employment )
  - Inequalities in education - in Chelsea 82% of children leave with 5 A\*-C GCSE'S whereas in Newham only 60% do.
  - Inequalities in
  - 9,400 deaths a year due to air pollution, mainly nitrous oxide, and 30% increase in the amount of children diagnosed with asthma. This is mainly in people from areas such as Newham (inequalities in health)

### **An example of an urban regeneration project in London: The 2012 Olympics**

#### **WHY WAS IT NEEDED?**

- ✓ -The Lower Lea Valley needed regeneration because:
- ✓ -There was lots of unused industrial land and facilities that had been contaminated by lots of chemicals.
- ✓ -Stratford was one of the most deprived areas in London e.g. the average income is £28,000 per year compared to £38,000 for the rest of London.
- ✓ -The River Lea and canals were already there for them to use.
- ✓ -To leave a legacy of facilities for the people that live there.

#### **FEATURES OF THE PROJECT:**

- ✓ \*West Ham now play football in the Olympic Park
- ✓ \*Aquatics centre used for swimming lessons by local primary schools.
- ✓ \*25,000 employed there in high rise offices.
- ✓ \*Green space in the Queen Elizabeth Olympic Park for walking
- ✓ \*Here East Media Centre - 5000 jobs
- ✓ \*Westfield Shopping Centre - 1000 jobs
- ✓ \*Stratford Train Station improved for people
- ✓ \*East Village (where the athletes lived) now has affordable housing for a mix of 2800 homes

#### **OVERALL JUDGEMENT:**

- Over 500 people were asked to leave their tower blocks at CLAYS LANE for them to be demolished to make way for the Olympic Stadium → led to lots of protests
- Cost £9.3 billion in money
- The cost of living for poor people in Newham/Stratford has increased due to it being a popular area to live.
- ✓ Better transport connections e.g. Stratford station
- ✓ Newham and Stratford have become very diverse
- ✓ The contaminated land has now been cleaned up



## Section B: The Changing Economic World

**There are different ways of measuring development according to their economic development and quality of life:**

LIC = Low Income Country

HIC = High Income Country

NEE = Newly Emerging Economy

**Economic futures in the UK:**

**Key words:**

- **Globalisation:** the increasing links between different countries throughout the world and the greater interdependence that results from this.
- **Interdependence:** the relationship between two or more countries, usually in terms of trade.
- **Industrialisation:** the increase in the amount of manufacturing and decrease in the amount of farming (primary)
- **De-industrialisation:** the decrease in the amount of manufacturing and an increase in the amount of tertiary (services)

**The UK's economy is split into four different sections:**

- Primary - growing and harvesting natural resources
- Secondary - making/manufacturing a product
- Tertiary - services - shops, doctors, lawyers, teachers
- Quaternary - research - medical

**The UK's economy has changed over time:**

- We have moved away from a primary/manufacturing economy and moved towards the tertiary and quaternary sector.
- **The tertiary and quaternary sector = A post-industrial economy is where manufacturing industry declines to be replaced by growth in the tertiary sector and quaternary sector.**
- 

The development of ICT has meant that we have a post-industrial economy because:

-Store and access lots of data and access it quickly

-The internet allows people to communicate with each other instantly

-Many people can access the internet on their smartphone

-People can work from home using the internet

Lots of people work in finance, research and the service industries.

**The causes of economic change in the UK:**

<b><u>Government policy</u></b>	<b><u>Deindustrialisation</u></b>	<b><u>Globalisation</u></b>
1945-1979 - The government owned industries in the UK and they spent money keeping them open. This led to strikes and power cuts.	Deindustrialisation is the decline in manufacturing industry (manufacturing) and the growth in the service industry.	Globalisation is the growth and spread of ideas around the world.
1979-2010 - The industries were sold off to private companies (privatisation) causing old industries to shut down and high job losses. Privatisation did bring lots of new industries.	This has happened because: -Machines and technology have replaced people -Other countries like China can produce cheaper goods due to cheaper labour	It has been made possible due to: -Developments in technology and communications e.g. the internet -Cheaper goods and services from abroad
2010 - There has been a push in the manufacturing sectors and new policies have included: improving infrastructure (e.g. HS2), loans to small businesses and encouraging global firms to locate in the UK.	-Lack of investment and high wages in the UK	-Foreign investment -Migration -Less manufacturing -Inequality -Outsourcing jobs

**A feature of a post-industrial economy = SCIENCE PARKS**

\*They are big estates where lots of scientific research takes place usually on the outskirts of big cities near to housing and good rail/road links

☺They help to support new and growing business through research and new ideas

☺Universities, such as Cambridge works with them and this means they get a good reputation ☺

☺We demand more products that need to be researched in science parks☺

E.G. Cambridge Science Park employs over 5000 people, is close to the M11 and close to Stansted Airport

## Other features of post-industrial economies:

- 1) Services - retail is the biggest service sector in the UK employing 44 million people
- 2) IT - It is a massive part of the economy with 60,000 employed in it.
- 3) Finance - The UK has global financial quarters e.g. HSBC
- 4) Research - E.g. Science parks.

## An example of how a modern industrial development can be made more environmentally sustainable: Nissan, Sunderland

### ★ KEY LEARNING

- The impacts of the car industry on the environment
- How the car industry can be more environmentally sustainable

## Making industry more sustainable

### What impacts does the car industry have on the environment?

The car industry is one of the few large-scale manufacturing industries left in the UK. More than 1.5 million new cars are made in the UK every year and most of them at just seven giant manufacturing plants. All of these are owned by foreign-owned TNCs such as Nissan, Honda and BMW.

The car industry does not enjoy the best reputation due to its impact on the environment, for example, most people know that in cities emissions from cars is one of the main causes of air pollution (see Section 15.10). Less well-known are the other environmental impacts cars have through their lifetime, from the resources used in their manufacture to their disposal at the end of the car's life (Figure 20.32).

#### Fuel consumption

Most cars run on petrol or diesel, which are both obtained from oil; the cause of many environmental problems:

- Drilling for oil uses energy and can endanger ecosystems.
- Shipping oil can cause oil spills.
- As oil is used up, new sources are harder to obtain and can cause more problems.

#### Resources

Cars are made from a range of resources including steel, rubber, glass, plastic, paint and fabric. Manufacturing and transporting these resources also uses energy.

#### Air pollution

Burning petrol or diesel in cars is a major cause of air pollution. The main pollutants are carbon dioxide (the main greenhouse gas), nitrogen dioxide (a cause of breathing problems) and particulates (tiny particles, which also cause breathing problems).

#### Manufacture

Cars consume a lot of energy even before they are driven. It is estimated that manufacturing a car uses as much energy as the car will consume in its lifetime on the road.



#### Disposal

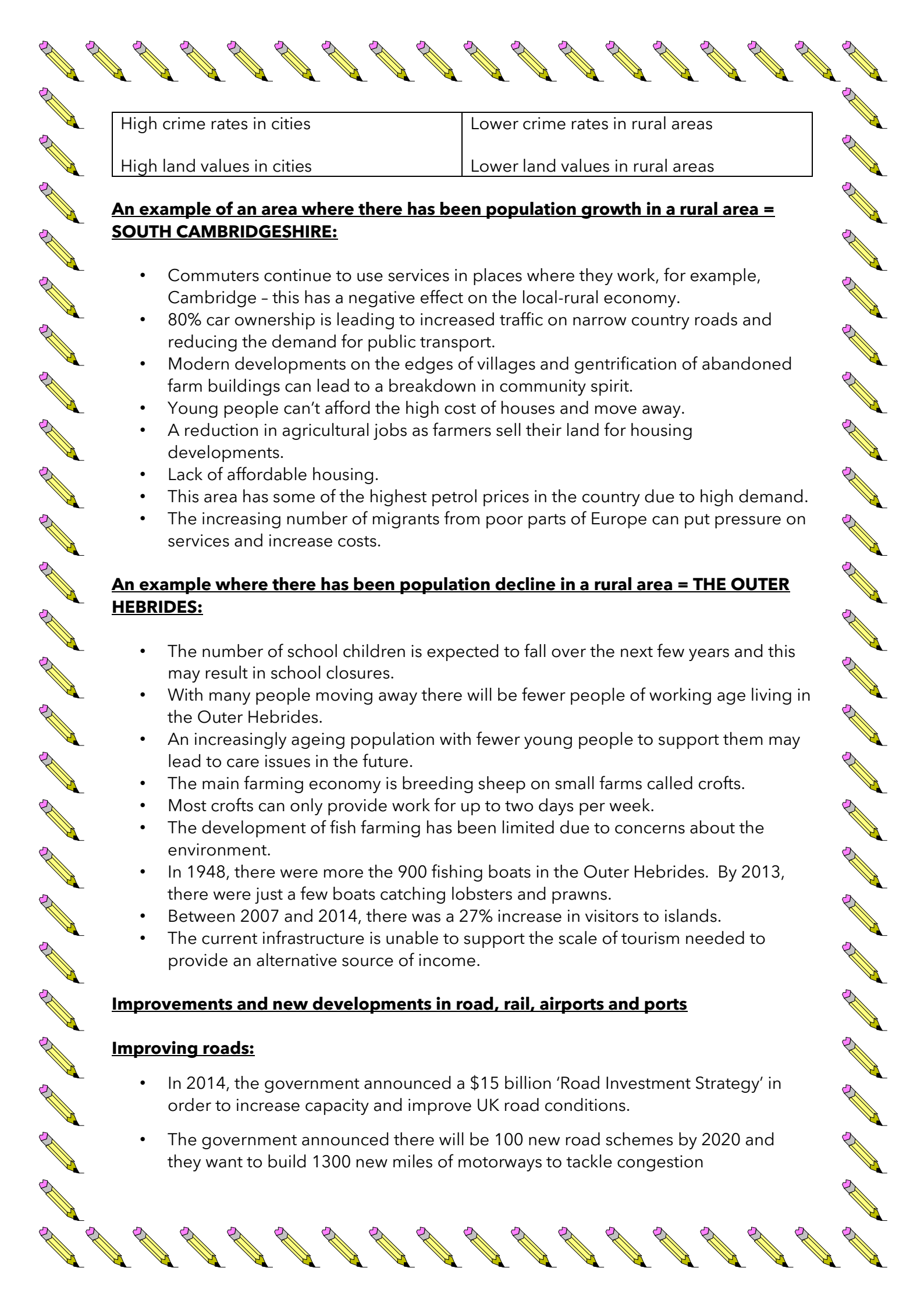
Cars end up on the scrap heap at the end of their life. Some components like plastic are hard to recycle. Others, like the acid in batteries, can leak into the environment.

▲ Figure 20.32 Environmental impacts of the car industry

**Nissan Car Plant, Sunderland:** Car manufacturing was not sustainable in the past due to inefficient engines producing toxic pollutants, parts that were difficult to recycle and the energy-intensive production processes. However, the situation is very different today. Over 7000 people are employed by Nissan at its car manufacturing plant in Sunderland. The factor has become efficient in a number of ways:

- The site has 10 wind turbines generating 6.6MW and 19,000 photo-voltaic panels (solar panels) generating 4.75MW of energy. This equates to 7% of the plant's electrical requirements, enough to build 31,374 vehicles.
- Nissan is developing electric and hybrid cars.
- CO2 levels have been reduced by 22.4% since 2005.
- The Skills Academy for Sustainable Manufacturing and Innovation (SASMI) supports the industry's future through specialist training. Based at Nissan's Sunderland plant, SASMI provides a training infrastructure for sustainable manufacturing and the low carbon vehicle industry, and a learning facility for employers, apprentices and students, providing new skills for new jobs.





High crime rates in cities	Lower crime rates in rural areas
High land values in cities	Lower land values in rural areas

**An example of an area where there has been population growth in a rural area = SOUTH CAMBRIDGESHIRE:**

- Commuters continue to use services in places where they work, for example, Cambridge - this has a negative effect on the local-rural economy.
- 80% car ownership is leading to increased traffic on narrow country roads and reducing the demand for public transport.
- Modern developments on the edges of villages and gentrification of abandoned farm buildings can lead to a breakdown in community spirit.
- Young people can't afford the high cost of houses and move away.
- A reduction in agricultural jobs as farmers sell their land for housing developments.
- Lack of affordable housing.
- This area has some of the highest petrol prices in the country due to high demand.
- The increasing number of migrants from poor parts of Europe can put pressure on services and increase costs.

**An example where there has been population decline in a rural area = THE OUTER HEBRIDES:**

- The number of school children is expected to fall over the next few years and this may result in school closures.
- With many people moving away there will be fewer people of working age living in the Outer Hebrides.
- An increasingly ageing population with fewer young people to support them may lead to care issues in the future.
- The main farming economy is breeding sheep on small farms called crofts.
- Most crofts can only provide work for up to two days per week.
- The development of fish farming has been limited due to concerns about the environment.
- In 1948, there were more than 900 fishing boats in the Outer Hebrides. By 2013, there were just a few boats catching lobsters and prawns.
- Between 2007 and 2014, there was a 27% increase in visitors to islands.
- The current infrastructure is unable to support the scale of tourism needed to provide an alternative source of income.

**Improvements and new developments in road, rail, airports and ports**

**Improving roads:**

- In 2014, the government announced a \$15 billion 'Road Investment Strategy' in order to increase capacity and improve UK road conditions.
- The government announced there will be 100 new road schemes by 2020 and they want to build 1300 new miles of motorways to tackle congestion

- The government want extra lanes on main motorways to make them 'smart motorways'. This means they will be able to control the flow of traffic better to ease congestion and alert people about accidents
- The South West Super Highway is a new £2billion road widening project which will make a dual carriageway between the M3 and the M5. The scheme needs to build a 3km tunnel under Stonehenge.

**Improving railways:**

- Investment in railways by the government is vital to connect the UK to Europe and stimulate growth in the north of the UK
- The government want to build HS2 (High Speed Rail 2), a £50 billion high speed railway line between London and the North.
- HS2 will open in 2029 with Birmingham being the first city to be connected. This has cost the government £23 billion.
- The new Crossrail has been built connecting Heathrow and Reading to West London at a cost of £18.8 billion. This is known as the 'Elizabeth line'.

**Improving ports:**

- A new port is being built at Liverpool called Liverpool2. The cost is around £400 million and it going to double capacity to over 1.5 million containers a year.
- Liverpool 2 is funded by the government UK to boost the economy of the north-west.
- Liverpool 2 will help companies reduce costs and reduce carbon dioxide emissions as sell goods will be transport by road

**Improving airports:**

- Heathrow could expand by 2030 at a cost of £18.6 billion.
- Heathrow is currently a full capacity (it cannot fly any more planes than it currently does).
- Heathrow want to build a third runway but the government are unsure
- Some people think that Manchester airport should be expanded too

<p>Example of an improvement in rail infrastructure (also something that reduces the N/S divide) = HS2</p>	<p>Example of an improvement in airport infrastructure = the proposed Third Runway at Heathrow</p>
<p><b><u>POSITIVES:</u></b></p> <ul style="list-style-type: none"> <li>-Rising travellers - need it to cope with 2x demand.</li> <li>-Boost the economy £7billion extra a year</li> <li>-New planes e.g. Airbus A380 - not polluting</li> </ul>	<p><b><u>POSITIVES:</u></b></p> <ul style="list-style-type: none"> <li>-Rising travellers - need it to cope with 2x demand.</li> <li>-Boost the economy £7billion extra a year</li> <li>-New planes e.g. Airbus A380 - not polluting</li> </ul>

-10,000+ jobs

-10,000+ jobs

**NEGATIVES:**

-Heathrow generated 6% of the Uk's co2 emissions.

-Exceed EU regulations on nitrous oxide.

-200,000 extra flights → asthma and high blood pressure

-Sipson - 700 houses knocked down.

**The north-south divide: REGIONAL DIFFERENCES!**

"The North South Divide is often referred to as the **cultural and economic** differences between Southern England and Northern England"

**Arguments for and against the North/South Divide:**

**FOR**

Education:

- OFSTED stated that there is a north south divide. The north has a lower % of good and outstanding schools
- On average, 70% of pupils attain 5A\*-C in London. In Yorkshire, this number is 63%
- 13 out of 16 schools where less than 60% of pupils in the area attend a good or outstanding school are in the north

Pay:

- London and the South East are the only two places in England with wages above the national average
- North East has the worst pay in the UK
- Average wage in the North East = £17,000 and in London = £35,000

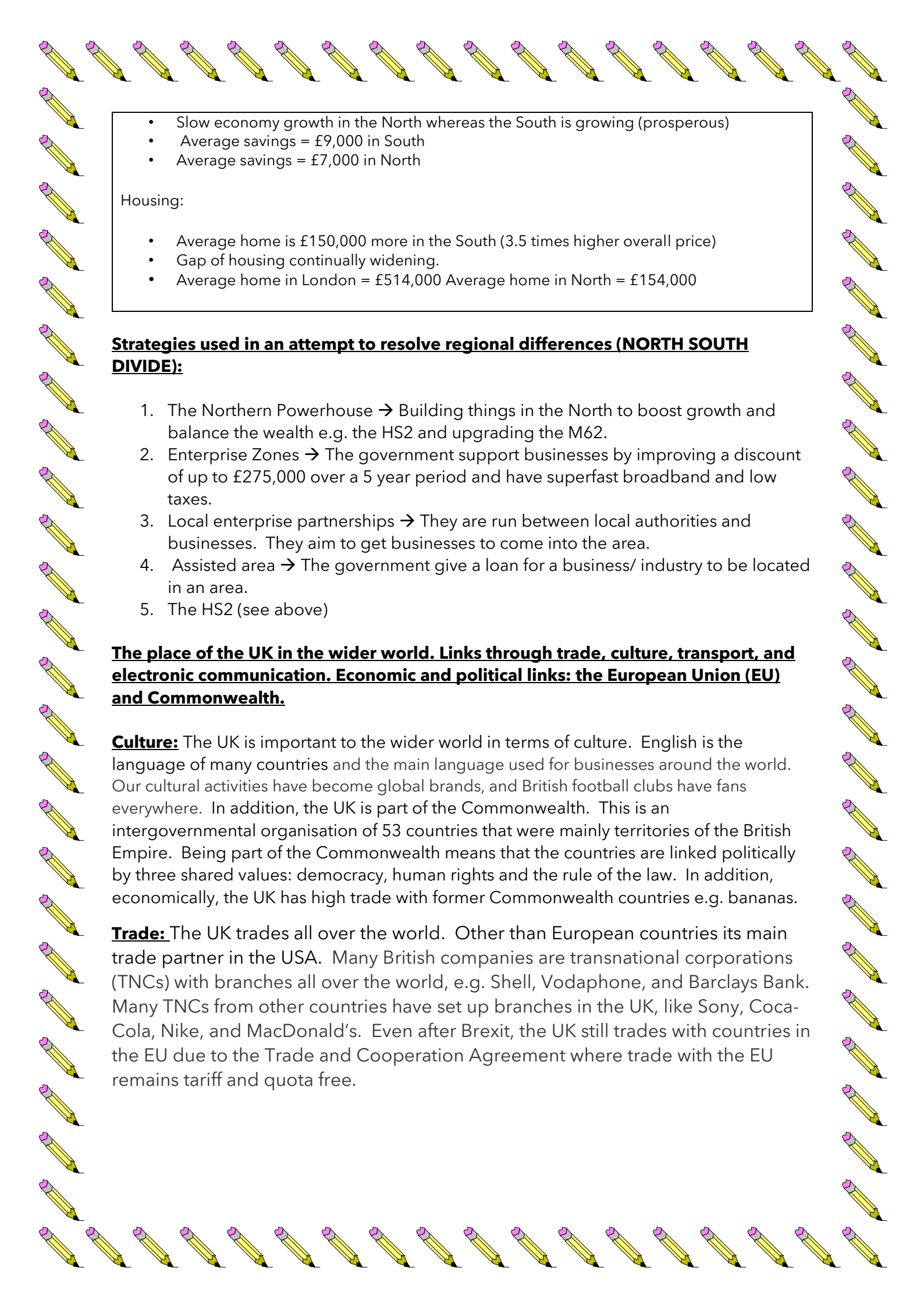
Flood Defences:

- Government have been criticised for spending more money on flood defences in the south - £122 per person in the North and £167 per person in the South.
- North East worst hit by flood in 2016 and only has £30 per person spent on flood defences.
- Leeds barrier £180million (North) was cancelled and replaced by a smaller, £45million barrier

Money:

- Loss of industry e.g. mining and steel in the north = loss of money in the area and unemployment



- 
- Slow economy growth in the North whereas the South is growing (prosperous)
  - Average savings = £9,000 in South
  - Average savings = £7,000 in North

Housing:

- Average home is £150,000 more in the South (3.5 times higher overall price)
- Gap of housing continually widening.
- Average home in London = £514,000 Average home in North = £154,000

**Strategies used in an attempt to resolve regional differences (NORTH SOUTH DIVIDE):**

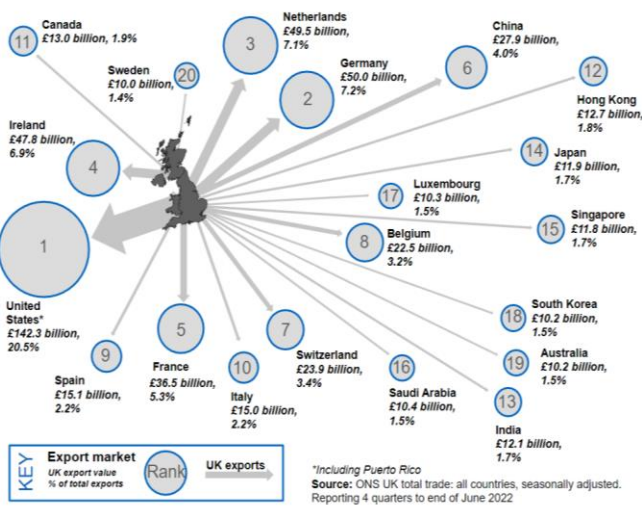
1. The Northern Powerhouse → Building things in the North to boost growth and balance the wealth e.g. the HS2 and upgrading the M62.
2. Enterprise Zones → The government support businesses by improving a discount of up to £275,000 over a 5 year period and have superfast broadband and low taxes.
3. Local enterprise partnerships → They are run between local authorities and businesses. They aim to get businesses to come into the area.
4. Assisted area → The government give a loan for a business/ industry to be located in an area.
5. The HS2 (see above)

**The place of the UK in the wider world. Links through trade, culture, transport, and electronic communication. Economic and political links: the European Union (EU) and Commonwealth.**

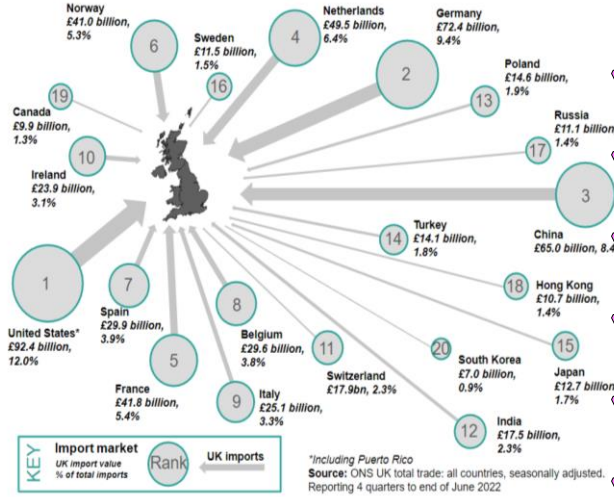
**Culture:** The UK is important to the wider world in terms of culture. English is the language of many countries and the main language used for businesses around the world. Our cultural activities have become global brands, and British football clubs have fans everywhere. In addition, the UK is part of the Commonwealth. This is an intergovernmental organisation of 53 countries that were mainly territories of the British Empire. Being part of the Commonwealth means that the countries are linked politically by three shared values: democracy, human rights and the rule of the law. In addition, economically, the UK has high trade with former Commonwealth countries e.g. bananas.

**Trade:** The UK trades all over the world. Other than European countries its main trade partner in the USA. Many British companies are transnational corporations (TNCs) with branches all over the world, e.g. Shell, Vodaphone, and Barclays Bank. Many TNCs from other countries have set up branches in the UK, like Sony, Coca-Cola, Nike, and MacDonald's. Even after Brexit, the UK still trades with countries in the EU due to the Trade and Cooperation Agreement where trade with the EU remains tariff and quota free.

### 3.2 UK export markets for goods and services 4 quarters to the end of June 2022



### 4.2 UK import markets for goods and services 4 quarters to the end of June 2022



**Electronic communications:** The UK has an extensive electronic communication network not only across the whole country but linking it to other parts of the world and the internet allows people to work from home e.g. 1 in 6 people work from home. Globally, the UK is linked up via a vast cable network under the sea. We have cables linking us to North and South America, Europe, Africa.

**Transport:** The UK is an international transport hub e.g. international airports, such as Heathrow and huge ports, such as the Thames Port which export goods around the world. In addition, there are rail links to the continent, such as the Eurostar.

## Checklist for Physical paper

### The living world

Do I know...	Red	Amber	Green
-An example of a small-scale ecosystem in the UK (a pond) to show the interrelationships within it between producers, consumers, decomposers, food chains, food web and nutrient cycling.			
-What impact will changing one component in the ecosystem have on the rest of the ecosystem			
-To know the distribution and characteristics of global ecosystems e.g. deserts, tropical rainforests, polar, tundra.			
-To know the physical characteristics of the tropical rainforest			
-To understand how the climate, water, soils, plants, animals and people are interdependent in the tropical rainforest.			
-How specific plants and animals have adapted to the physical conditions of the tropical rainforests			
-To know biodiversity and the issues with this in the tropical rainforest			
-To know deforestation and the changing rates of this			
-The Amazon rainforest (Brazil) - to know the causes (subsistence and commercial farming, logging, road building, mineral extraction, energy development, settlement and population growth) and impacts (economic development, soil erosion and contribution to climate change) of deforestation			
-To know the value of the rainforest to people and the environment			
-Strategies to manage the rainforest sustainably - selective logging and replanting, conservation and education, ecotourism, debt reduction and international agreements about the use of hardwoods			
-The physical characteristics of cold environments			
-The interdependence of climate, permafrost, soils, plants, animals and people			
-Issues related to biodiversity in cold environments			
-Alaska (USA) - the development opportunities (mineral extraction, energy, fishing and tourism)			
-Alaska (USA) - the challenges (extreme temperature, inaccessibility and buildings and infrastructure)			

-The value of cold environments as wilderness areas and why these fragile environments should be protected			
-Strategies to balance the need of economic development and conservation in cold environments (use of technology, role of governments, international agreements and conservation groups).			

**Coasts**

Do I know...	Red	Amber	Green
-An overview of the location of major upland/lowland areas and river systems			
-The different types of waves and their characteristics			
-Coastal processes - weathering (mechanical and chemical), mass movement (sliding, slumping and rock fall) and erosion (hydraulic power, abrasion and attrition)			
-Coastal processes - transportation (longshore drift) and deposition (why is sediment deposited in coastal areas)			
-How geological structure and rock types influence coastal landforms			
-Landforms of erosion - headlands and bays, cliffs and wave cut platforms, caves, arches and stacks - what are the characteristics and how is each one created by erosion			
-Landforms of deposition - beaches, sand dunes spits and bars - what are the characteristics and how is each one created by deposition			
-The Jurassic Coast - An example of a UK coastlines landforms of erosion and deposition			
-The costs and benefits of hard engineering (sea walls, rock armour, gabions and groynes), soft engineering (beach nourishment and reprofiling and dune regeneration) and managed retreat (coastal realignment)			

**Rivers**

Do I know...	Red	Amber	Green
-The long and cross profile of the river and the river valley			
-Fluvial processes - erosion (hydraulic action, abrasion, attrition, solution, vertical and lateral erosion), transportation (traction, saltation, suspension and solution) and deposition (why a river deposits sediment)			

-Landforms of erosion - interlocking spurs, waterfall and gorges - what are the characteristics and how is each one created by erosion			
-Landforms of erosion and deposition - meanders and oxbow lakes - what are the characteristics and how is each one created by erosion and deposition			
-Landforms of deposition - levees, floodplains and estuaries - what are the characteristics and how is each one created by deposition			
-The River Tees - An example of a UK river valley's landforms of erosion and deposition			
-How physical and human factors affect flood risk (precipitation, geology, relief and land use)			
-Hydrographs to show the relationship between precipitation and discharge			
-The costs and benefits of management strategies - hard engineering (dams and reservoirs, straightening, embankments and flood relief channels) and soft engineering (flood warnings and preparation, flood plain zoning, planting trees and river restoration)			
-The Jubilee River (flood relief channel) - to know why the scheme was needed and the social, economic and environmental issues of it			





# Revision Guide for Physical Paper

## Section B: The Living World

**\*YOU NEED TO ANSWER THIS AND THE COLD ENVIRONMENTS SECTION\***

### **Ecosystems are made up of:**

-**Living things** (plants, animals and bacteria) = BIOTIC FACTORS

-**Non-living things** (such as climate and soil) = ABIOTIC FACTORS

**\*They can be at a small scale e.g. a hedgerow or a large scale e.g. tropical rainforest\***

### **Key words:**

Ecosystem = The living and non-living components of an environment and the interrelationships that exist between them

Biome = A global scale ecosystem.

Habitat = Small areas of an ecosystem where a particular species may live.

Adaptations = The ways that plants evolve to cope with certain conditions, such as lots of rainfall.

Producers = Plants use sunlight, water and nutrients from the soil to produce their own food.

Consumers = Animals get their energy by feeding on plants or each other.

Food chain = A line of links between producers and consumers.

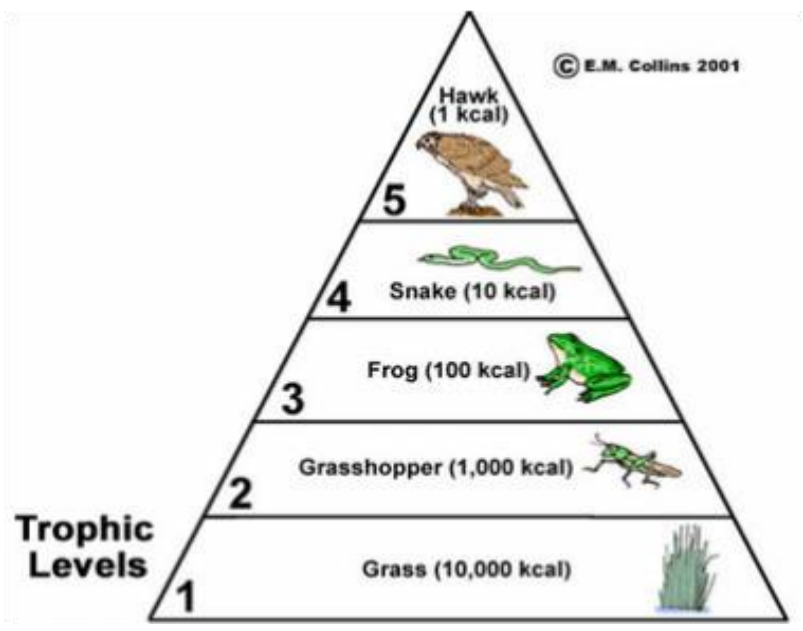
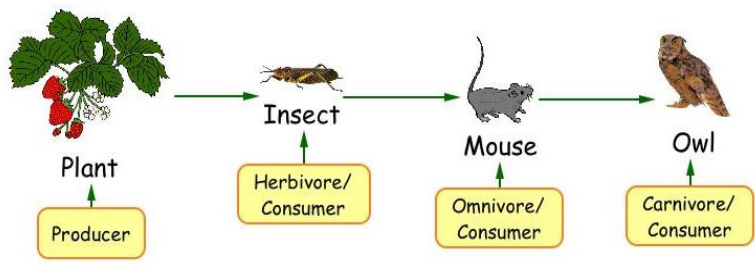
Food web = A diagram that shows all the links between producers and consumers in an ecosystem.

Scavengers = Organisms that eat dead animals or plants.

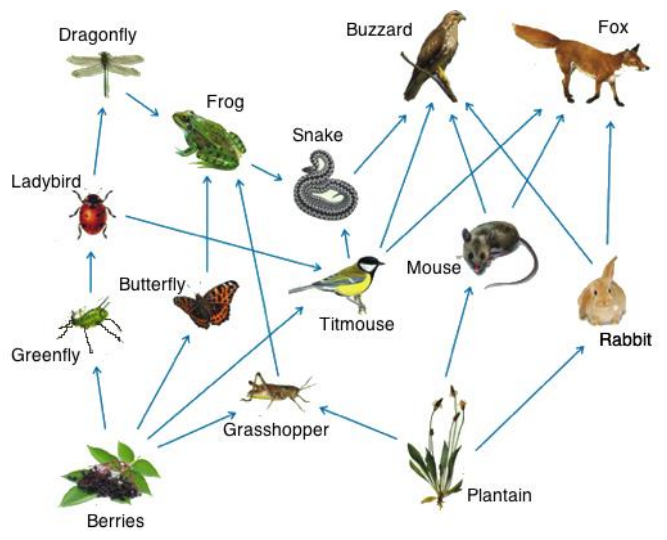
Decomposers = Fungi and bacteria eat the dead/waste material and make things break down and rot. They recycle nutrients for the plants to use again.

Nutrient cycling = The recycling of nutrients between living organisms and the environment

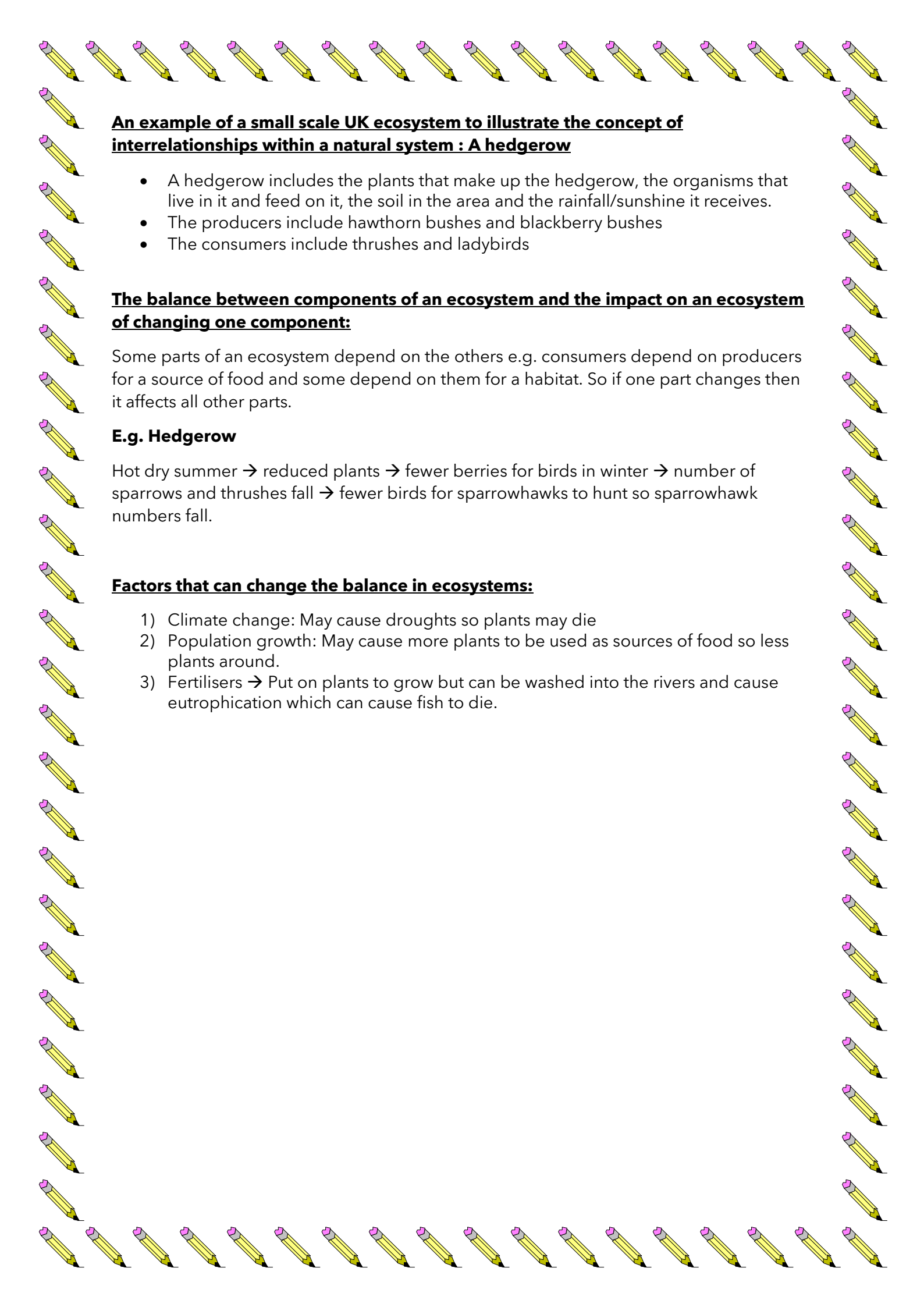
**food chain:**



**Food web:**







## **An example of a small scale UK ecosystem to illustrate the concept of interrelationships within a natural system : A hedgerow**

- A hedgerow includes the plants that make up the hedgerow, the organisms that live in it and feed on it, the soil in the area and the rainfall/sunshine it receives.
- The producers include hawthorn bushes and blackberry bushes
- The consumers include thrushes and ladybirds

## **The balance between components of an ecosystem and the impact on an ecosystem of changing one component:**

Some parts of an ecosystem depend on the others e.g. consumers depend on producers for a source of food and some depend on them for a habitat. So if one part changes then it affects all other parts.

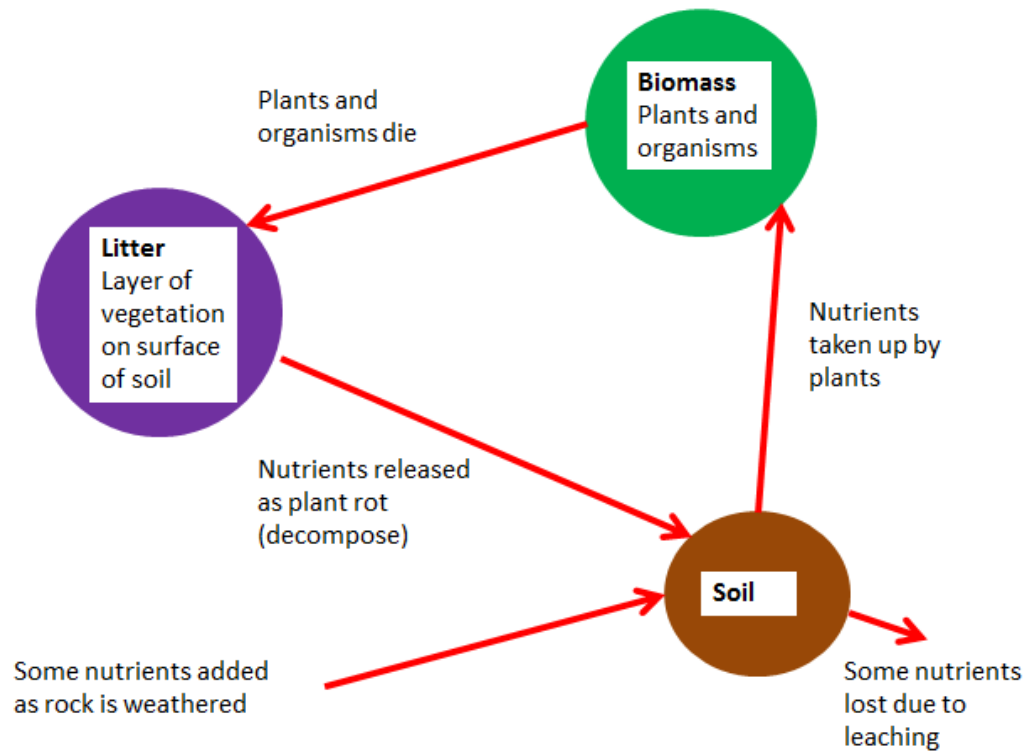
### **E.g. Hedgerow**

Hot dry summer → reduced plants → fewer berries for birds in winter → number of sparrows and thrushes fall → fewer birds for sparrowhawks to hunt so sparrowhawk numbers fall.

## **Factors that can change the balance in ecosystems:**

- 1) Climate change: May cause droughts so plants may die
- 2) Population growth: May cause more plants to be used as sources of food so less plants around.
- 3) Fertilisers → Put on plants to grow but can be washed into the rivers and cause eutrophication which can cause fish to die.

## The nutrient cycle:



Ecosystems rely on two processes:

- 1) Recycling nutrients → Nutrients constantly go round the ecosystem.
- 2) Energy flows → Ecosystems work because there is energy flows in them. The main source is the sun → absorbed by plants in photosynthesis → energy passed through system in food chain

## An overview of the distribution and characteristics of large scale natural global ecosystems:

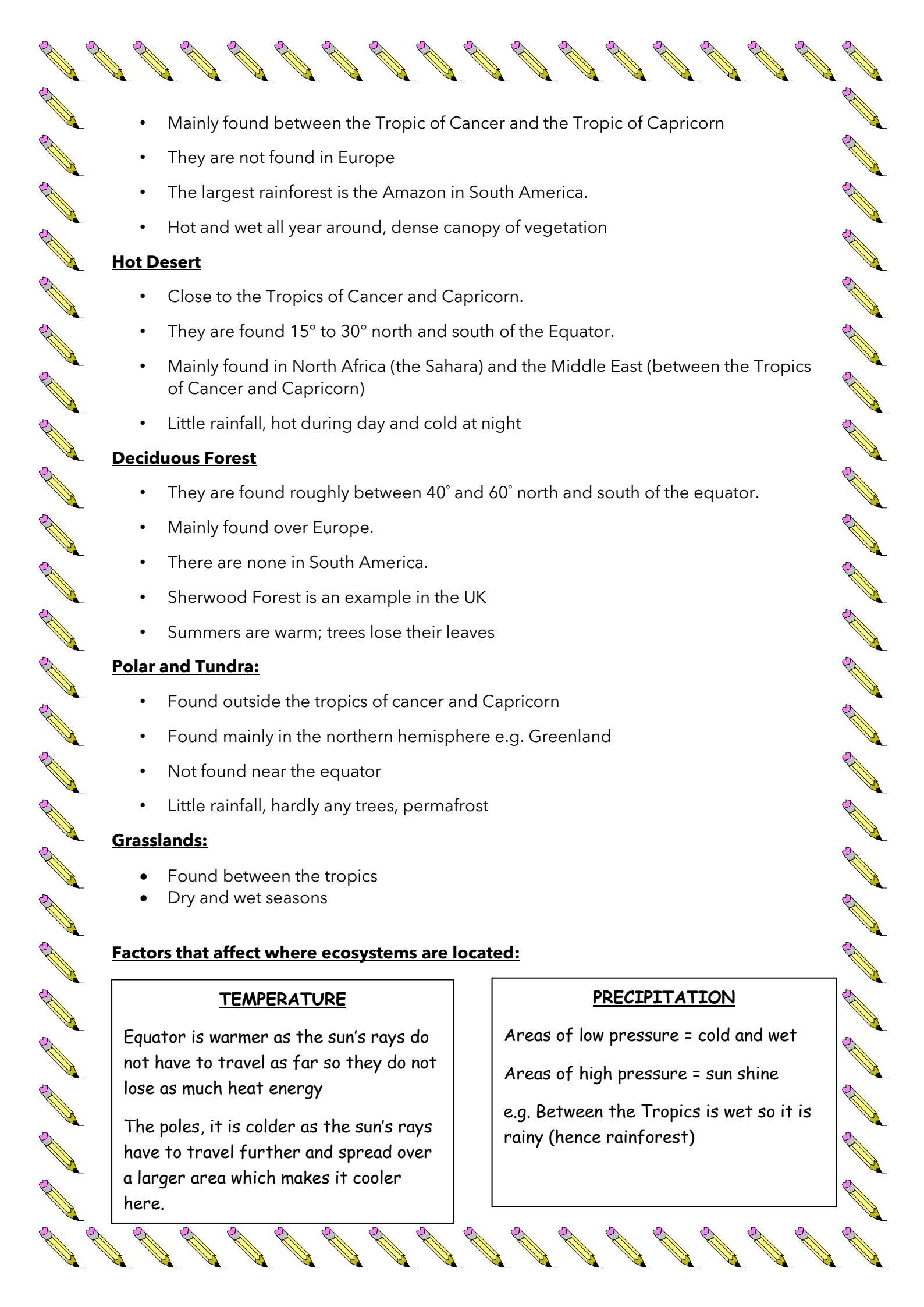
### **Distribution = where ecosystems are found and why**

\*Remember that if you get a map you need to use countries, continents and compass directions\*

\*You also need to know where ecosystems are located off by heart as you will not always get a map!\*

### **Tropical Rainforest**

- They are found close to the equator (approximately 0°-20° north and south of the equator).

- 
- Mainly found between the Tropic of Cancer and the Tropic of Capricorn
  - They are not found in Europe
  - The largest rainforest is the Amazon in South America.
  - Hot and wet all year around, dense canopy of vegetation

### **Hot Desert**

- Close to the Tropics of Cancer and Capricorn.
- They are found 15° to 30° north and south of the Equator.
- Mainly found in North Africa (the Sahara) and the Middle East (between the Tropics of Cancer and Capricorn)
- Little rainfall, hot during day and cold at night

### **Deciduous Forest**

- They are found roughly between 40° and 60° north and south of the equator.
- Mainly found over Europe.
- There are none in South America.
- Sherwood Forest is an example in the UK
- Summers are warm; trees lose their leaves

### **Polar and Tundra:**

- Found outside the tropics of cancer and Capricorn
- Found mainly in the northern hemisphere e.g. Greenland
- Not found near the equator
- Little rainfall, hardly any trees, permafrost

### **Grasslands:**

- Found between the tropics
- Dry and wet seasons

### **Factors that affect where ecosystems are located:**

#### **TEMPERATURE**

Equator is warmer as the sun's rays do not have to travel as far so they do not lose as much heat energy

The poles, it is colder as the sun's rays have to travel further and spread over a larger area which makes it cooler here.

#### **PRECIPITATION**

Areas of low pressure = cold and wet

Areas of high pressure = sun shine

e.g. Between the Tropics is wet so it is rainy (hence rainforest)



## LOCAL FACTORS

Altitude - As you go higher, it gets colder.

Continentality (Distance from the sea) Away from the sea, land is warmer in summer and cooler in winter

Nutrient rich environment - gives food for plants either from the soil or sea

Ocean currents: A cold ocean current flowing along the South American coast creates dry conditions because little evaporation happens when it is cold. This has created deserts like the Atacama.

## Tropical Rainforests

### **CLIMATE:**

- A tropical rainforest has a hot, wet climate with no definitive season.
- They receive approximately **2,000mm rainfall a year** and experience temperatures at **27°C on average** throughout the year.
- Temperatures are high and constant all year because the **solar rays are powerful over the equator** and the Sun is overhead most of the time.
- Rainfall is high because the **global atmospheric circulation** causes an area of **low pressure** over the equator (so the air rises) which creates clouds.
- **Rainfall does vary** throughout the year, with a distinct wet season lasting 6 months of the year (Dec-May).

### **SOIL:**

- Soil is ***not fertile*** because the heavy rain washes away the nutrients, this is known as ***leaching***.
- However a ***thin layer of nutrients*** is found at the top due to the leaf litter where many plants and animals decompose.
- This soil is known as ***red soil*** or ***latosol*** as it is rich in iron.

### **PLANTS:**

There are 4 distinct layers in the stratification of a tropical rainforest:

1. Emergent layer - Fast growing tree that sticks out above the main canopy (approx. 45m tall). Here you will find the tallest trees and broad leaves.

2. Canopy layer - Provides a roof to the two layers below. Here you will find leaves that are oval and come to a point. Also there are lots of animals here.
3. Under canopy - The leaves here grow the biggest as they fight to find the sunlight. Here there are lots of insects.
4. Shrub layer/forest floor - There is little vegetation here as the sunlight rarely reaches the forest floor so plants quickly die here.

**WATER:**

- Rainforest ecosystems are characterised by heavy convectional rainfall, high humidity, lushness of vegetation and nutrient-rich but shallow soil. These factors give rise to a unique water and nutrient cycle.
- The roots of plants take up water from the ground and the rain is intercepted as it falls much of it at the canopy level.
- As the rainforest heats up, the water evaporates into the atmosphere and forms clouds to make the next day's rain. This is convectional rainfall.

**PEOPLE:**

- The rainforests are home to many people who have adapted to life there over many generations. They make a living by hunting and fishing, gathering nuts, berries and growing vegetables in small garden plots.

**ANIMAL ADAPTATIONS TO THE PHYSICAL CONDITIONS:**

<b><u>ANIMAL</u></b>	<b><u>CHARACTERISTICS</u></b>	<b><u>ADAPTATION:</u></b>
<b><u>JAGUAR</u></b>	Rosettes/spots Large feet	Rosettes/spots for camouflage when hunting prey Large feet - to walk through small streams and sand banks and not sink
<b><u>CAPYBARA</u></b>	Webbed feet Nose is high up on its head	Webbed feet - to swim through the many streams/streams Nose is high up on its head - to help it swim in the wet environment
<b><u>TOUCAN</u></b>	Colourful and strong beak Eyes on the side of its head	Strong beak to crack food like nuts. This can also spread the seeds from a tree Eyes to see prey

## **PLANT ADAPTATIONS TO THE PHYSICAL CONDITIONS:**

<b><u>PLANT</u></b>	<b><u>CHARACTERISTICS</u></b>	<b><u>ADAPTATION</u></b>
<b><u>Buttress Roots</u></b>	these are very wide at the base of a tree	The soil in the rainforest is red, not very fertile and quite shallow. The roots of this tree spread out wide to allow it to get more nutrients.
<b><u>Dip tip leaves</u></b>	leaves often have a long pointed tip	Water can run off the leaf so it does not break off the branch during heavy rainfall
<b><u>Kapok Tree</u></b>	Smooth bark	the smooth bark allows the water to run down to it roots helping it grow

## **Rainforests are interdependent ecosystems:**

- 1) The warm and wet climate means that dead plant material is decomposed quickly by fungi and bacteria on the forest floor. This makes the surface soil high in nutrients, meaning that plants can grow quickly and easily.
- 2) Plants pass on their nutrients when they are eaten by animals. The dense vegetation provides lots of food so animal populations are high. Many plant and animal species have formed symbiotic relationships (where everything relies on each other) e.g.

**Agouti (a rodent) cracks open brazil nuts and they can bury them into new seedlings. However, if the agouti become extinct then Brazil nut trees would decline and other animals who feed on them would decline. The people who also sell the Brazil nuts would lose money.**

- 3) Changes to the rainforest ecosystem e.g. people reducing tree cover via deforestation could have knock on effects on the whole ecosystem e.g. reducing the amount of CO<sub>2</sub> would add to the greenhouse effect and warm the climate.
- 4) Trees also intercept and take up lots of water and release it back into the atmosphere, providing moisture for further rainfall. Deforestation means that the climate may change and drought may increase which affects the plants and animals in the ecosystem.

## **Rainforests have high biodiversity:**

- 1) Biodiversity means the huge variety of plants and animals in an area
- 2) Rainforests contain 50% of the world's animal, plant and insect species.
- 3) Rainforests are stable all year around the plants and animals don't have to cope with changing conditions.
- 4) Deforestation could lead to the loss of biodiversity e.g. the amount of extinct species was 628 in 2008.





## CASE STUDY of deforestation: Amazon Rainforest (BRAZIL)

### Key words:

**Deforestation = Removing trees from a forest**

**Afforestation - Adding trees to a forest**

### The changing rates of deforestation in the Amazon Rainforest:

- The rate of rainforest deforestation is very high - 130,000 km<sup>2</sup> per year
- Globally the rate of deforestation seems to be slowing down but there are still hotspots where the rate of deforestation is increasing e.g. Borneo
- Overall deforestation in Brazil and Indonesia accounted for almost half of the global total between 2001-2014 but Brazil has reduced its deforestation rate since 1990.

### THE VALUE OF THE AMAZON RAINFOREST:

- It could reduce the effects of climate change as trees absorb CO<sub>2</sub> and release oxygen - the Amazon stores around 100 billion tonnes of carbon!
- 28% of the world's oxygen comes from the rainforest
- Rainforests are rich in biodiversity (contains ½ world's plants and animals)
- 25% of all medicines come from rainforest plants
- The Amazon regulates the water cycle and without it some countries may risk droughts.

### CAUSES OF DEFORESTATION IN THE AMAZON RAINFOREST:

- **Logging** - This is often of hardwoods which is to make furniture. Logging is also done by the government to repay the debts they made in the 1960s.
- **Mineral extraction** - Mining is common with companies seeking gold.
- **Population growth** - People move from Rio to the rainforest to the new capital = Brasilia
- **Commercial farming** - Large spaces are needed for cattle ranches for example, McDonalds. Slash and burn is often done to create fertile soils.
- **Road building** - Trans-Amazonian Highway has improved communications.
- **Subsistence farming** - Forest is cleared so that farmers can grow food for themselves and their families.
- **Energy development** - Building dams to generate HEP which floods areas of the rainforest.



## THE IMPACTS OF DEFORESTATION IN THE AMAZON RAINFORESTS:

☺	☹
<ul style="list-style-type: none"> <li>✓ Companies will pay taxes to the government to improve public services (multiplier effect - economic development)</li> <li>✓ Farming creates money e.g. \$6.9 million/year trading cattle with McDonalds (economic development).</li> <li>✓ Improved transport infrastructure opens up more industry and tourism.</li> <li>✓ 3,100 people are employed in mines and minerals like gold are valuable</li> </ul>	<ul style="list-style-type: none"> <li>X Pollution from the Carajas mine of water sources resulting in water shortages.</li> <li>X Farming mean 55 million tonnes of top soil are lost every year (soil erosion). This is because there are no trees to hold the soil together so the soil gets washed away by the rain.</li> <li>X Plants that could be used for medical benefits may become extinct.</li> <li>X Deforestation will release carbon dioxide which causes global warming/ climate change → contributes to 15% of global co2 emissions per year.</li> </ul>

## LOCAL AND INTERNATIONAL SUSTAINABLE MANAGEMENT OF ECOSYSTEMS:

- **LOCAL - Agro-forestry** - Growing trees and crops at the same time to prevent soil erosion. Replanting in deforested areas by a project called REGUA
- **LOCAL - Selective logging and replanting** - Trees are only felled when they reach a particular height/mature. This maintains a strong gene pool of hardwoods. Replant 3 trees for every 1 cut down.
- **LOCAL - Ecotourism** - Yachana Eco lodge in Ecuador only allows 36 people in at any time and people get there by 54ft canoes. They only use sustainable sources e.g. solar panels, locally produced food and locals for tour guides
- **GLOBAL - Inter-government agreements on hardwoods and endangered species** - the FSC put their logo on sustainably logged hardwood and CITIES bocks the illegal trade of endangered animals
- **GLOBAL - Conservation and education** - Protect-An-Acre teaches children about conservation work and tourists can volunteer in the rainforest
- **GLOBAL - Reducing the debt** - Debt for nature swaps are done by the WWF; they pay some of Brazil's debts in return for protecting the rainforest. The USA have also paid £13.5 million of debt in 2010 so they protect the rainforest

## Cold Environments

### **Cold environments (polar and tundra) have a range of characteristics**

POLAR CLIMATE	TUNDRA CLIMATE
<ul style="list-style-type: none"><li>• Temperatures are never normally above 0°C</li><li>• Winters range from -40°C to -90°C</li><li>• Cold summers and even colder winters</li><li>• Rainfall/snowfall = &lt;100mm a year</li></ul>	<ul style="list-style-type: none"><li>• Temperatures range from 10°C in summer months to -50°C in winter months</li><li>• Cold summers and even colder winters</li><li>• Rainfall/snowfall = &lt;380mm a year</li></ul>
<b>POLAR SOIL:</b> <ul style="list-style-type: none"><li>• Covered in ice sheets so there is no soil exposed</li></ul>	<b>TUNDRA SOIL:</b> <ul style="list-style-type: none"><li>• Thin, acidic and not very fertile</li><li>• A layer of permafrost</li></ul>
<b>POLAR PLANTS:</b> <ul style="list-style-type: none"><li>• Very few plants - lichens and mosses and some grasses on the coast of Antarctica where it's warmer</li></ul>	<b>TUNDRA PLANTS:</b> <ul style="list-style-type: none"><li>• Plants grow slowly and don't grow very tall</li><li>• Some small, short trees can grow here</li></ul>
<b>POLAR ANIMALS:</b> <ul style="list-style-type: none"><li>• Polar bears, penguins, whales, seals and walrus</li></ul>	<b>TUNDRA ANIMALS</b> <ul style="list-style-type: none"><li>• Lemmings, Arctic hares, wolves, reindeer and caribou</li></ul>
<b>POLAR PEOPLE</b> <ul style="list-style-type: none"><li>• Almost uninhabitable except for scientists some of the year in Antarctica</li></ul>	<b>TUNDRA PEOPLE</b> <ul style="list-style-type: none"><li>• Home to many people including indigenous people and oil/gas workers in larger towns</li></ul>

### **Cold environments are fragile, interdependent ecosystems:**

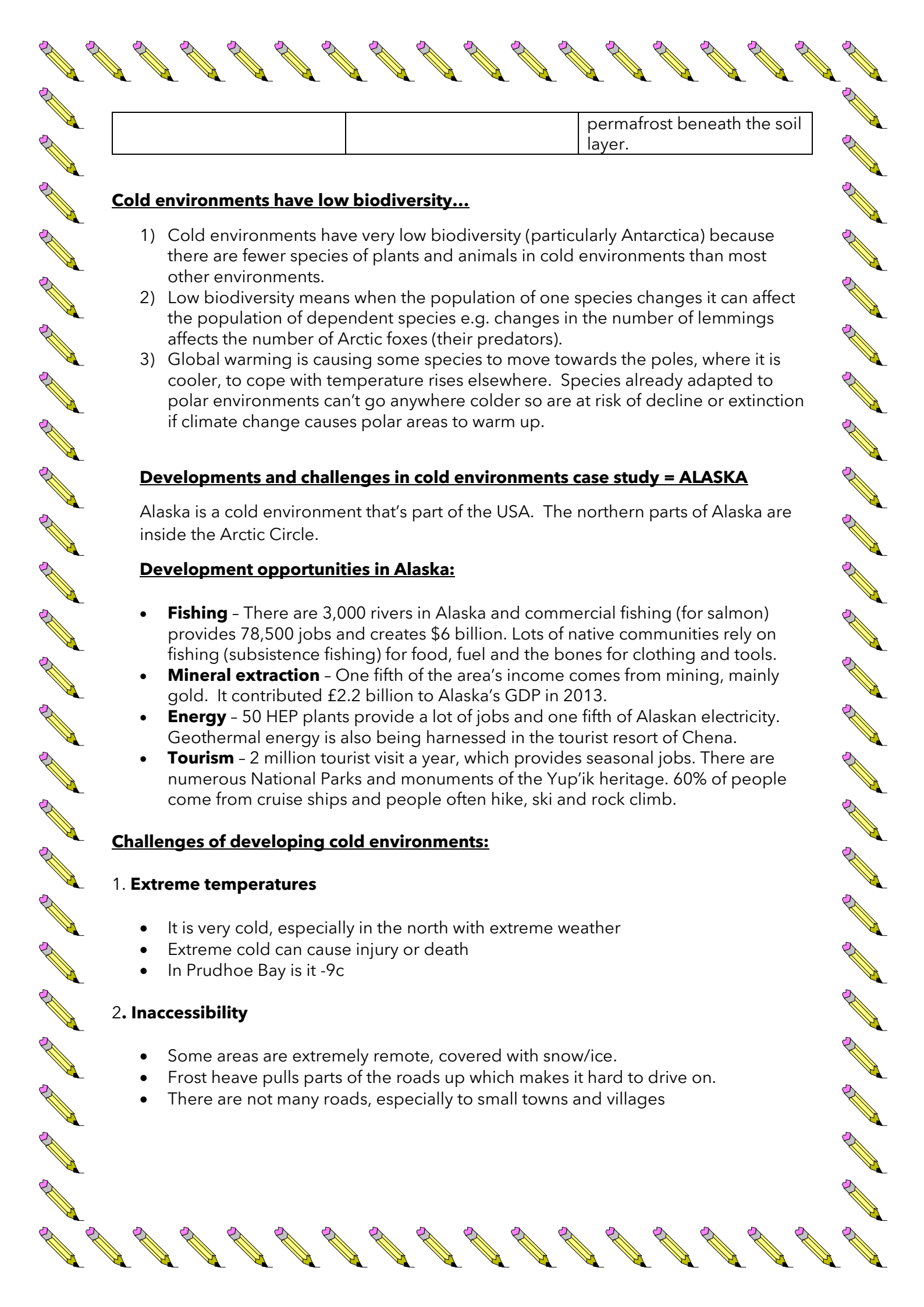
The biotics and abiotic features in a cold environment are closely related.

- 1) Plants gain their nutrients from the soil and provide nutrients to the animals that eat them. In turn, the animal spreads seeds through their dung, helping the plants to reproduce.
- 2) Plant cover is low - the cold climate causes plants to grow slowly and also to decompose very slowly. This means that the soil is low in nutrients and further reduces the ability of plants to grow.
- 3) Herbivores like reindeer rely on plants like mosses to survive must migrate to areas where plants are able to grow to find food. Carnivores like wolves follow the herbivores.
- 4) In summer, when the tundra has greater plant cover, the surface plants absorb heat from the sun and prevent the permafrost below from thawing. The permafrost provides water for plants.
- 5) Changes to component of the ecosystem e.g. plants damaging plant cover, can have knock on effect on the whole ecosystem e.g. by causing permafrost to melt. Melting permafrost can flood and prevent plants from growing. It also releases

trapped greenhouse gases which leads to increased global warming and changes the climate of cold environments which threatens plants and animals.

**PLANTS AND ANIMAL ADAPTATIONS TO PHYSICAL CONDITIONS:**

<b>ANIMALS</b>	CHARACTERISTIC	ADAPTATION
SNOWSHOE HARE	White fur	Can't be seen by predators against the snow
MUSK OX and CARIBOU	Two layers of fur  Large hooves	Protects against winter cold  To help them to travel over the soggy ground and break through ice to drink drinking water in the winter months
SEALS	Lots of blubber	To keep it insulated
<b>PLANTS</b>		
BEARBERRY	The plant has red berries and waxy green leaves. They are very low growing and have a thick stem	To enable it to survive strong winds. The waxy leaves allow the leaves to be water resistant. The stems are also hairy so they retain heat in the low temperature and the red berries can be eaten by birds to help distribute the seeds.
ARCTIC POPPY	Their cup shaped flowers face upwards to the sun	High latitudes mean that the light is weak leaving snow covering the plants for the aortic of the year. Plants have adapted to make maximum photosynthesis in the short periods = SUN GOES INTO THE CENTRE OF THE POPPY
MOSSES	Hairy leaves and small leaves	High air pressure causes strong, cold winds. Plants have adapted to ensure minimal transpiration - keep plant warm.
LICHENS	Shallow roots	To enable the plant to grow because of the layer of



	permafrost beneath the soil layer.
--	------------------------------------

### **Cold environments have low biodiversity...**

- 1) Cold environments have very low biodiversity (particularly Antarctica) because there are fewer species of plants and animals in cold environments than most other environments.
- 2) Low biodiversity means when the population of one species changes it can affect the population of dependent species e.g. changes in the number of lemmings affects the number of Arctic foxes (their predators).
- 3) Global warming is causing some species to move towards the poles, where it is cooler, to cope with temperature rises elsewhere. Species already adapted to polar environments can't go anywhere colder so are at risk of decline or extinction if climate change causes polar areas to warm up.

### **Developments and challenges in cold environments case study = ALASKA**

Alaska is a cold environment that's part of the USA. The northern parts of Alaska are inside the Arctic Circle.

#### **Development opportunities in Alaska:**

- **Fishing** - There are 3,000 rivers in Alaska and commercial fishing (for salmon) provides 78,500 jobs and creates \$6 billion. Lots of native communities rely on fishing (subsistence fishing) for food, fuel and the bones for clothing and tools.
- **Mineral extraction** - One fifth of the area's income comes from mining, mainly gold. It contributed £2.2 billion to Alaska's GDP in 2013.
- **Energy** - 50 HEP plants provide a lot of jobs and one fifth of Alaskan electricity. Geothermal energy is also being harnessed in the tourist resort of Chena.
- **Tourism** - 2 million tourist visit a year, which provides seasonal jobs. There are numerous National Parks and monuments of the Yup'ik heritage. 60% of people come from cruise ships and people often hike, ski and rock climb.

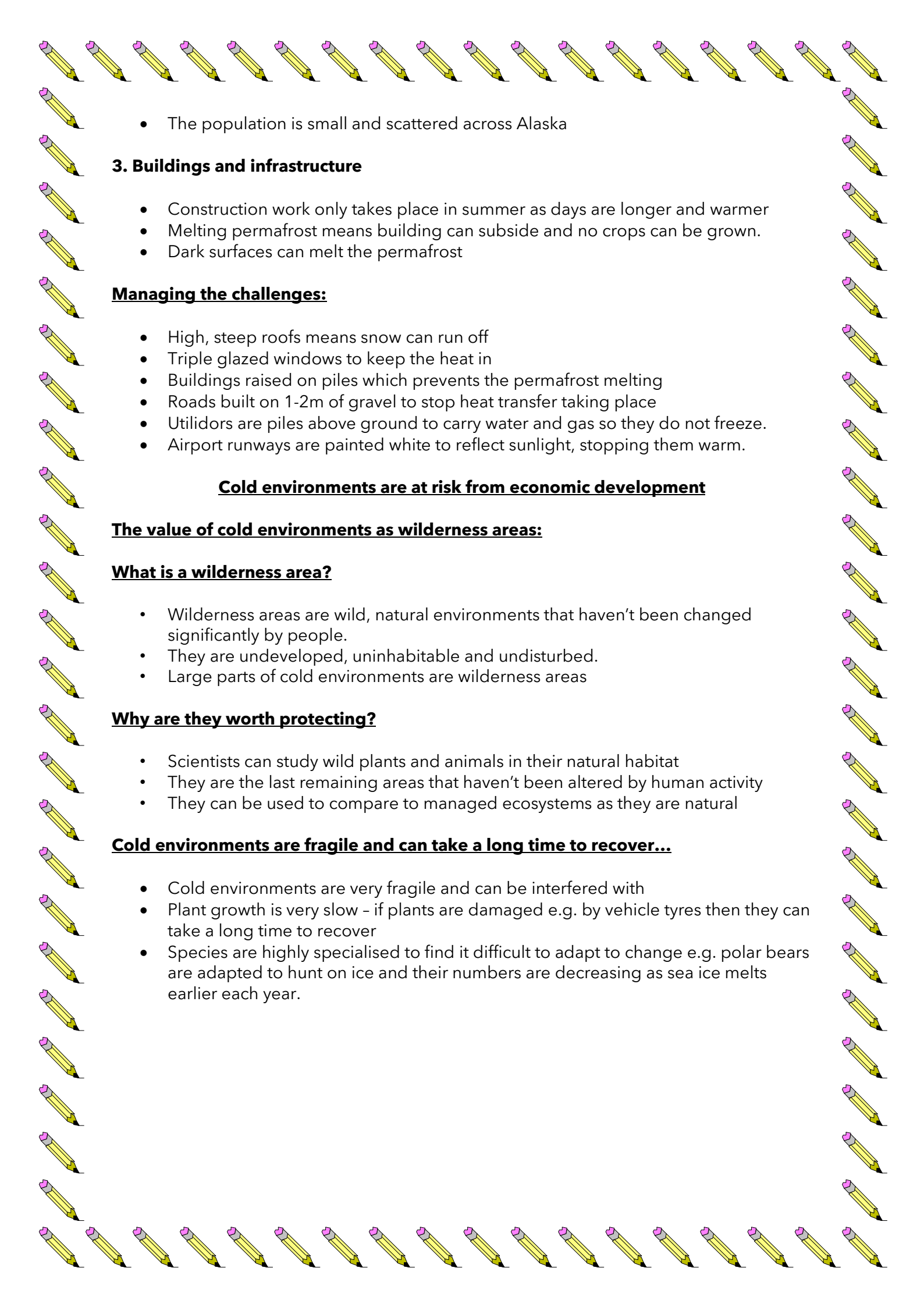
#### **Challenges of developing cold environments:**

##### **1. Extreme temperatures**

- It is very cold, especially in the north with extreme weather
- Extreme cold can cause injury or death
- In Prudhoe Bay it is -9c

##### **2. Inaccessibility**

- Some areas are extremely remote, covered with snow/ice.
- Frost heave pulls parts of the roads up which makes it hard to drive on.
- There are not many roads, especially to small towns and villages

- 
- The population is small and scattered across Alaska

### **3. Buildings and infrastructure**

- Construction work only takes place in summer as days are longer and warmer
- Melting permafrost means building can subside and no crops can be grown.
- Dark surfaces can melt the permafrost

#### **Managing the challenges:**

- High, steep roofs means snow can run off
- Triple glazed windows to keep the heat in
- Buildings raised on piles which prevents the permafrost melting
- Roads built on 1-2m of gravel to stop heat transfer taking place
- Utilidors are piles above ground to carry water and gas so they do not freeze.
- Airport runways are painted white to reflect sunlight, stopping them warm.

#### **Cold environments are at risk from economic development**

#### **The value of cold environments as wilderness areas:**

##### **What is a wilderness area?**

- Wilderness areas are wild, natural environments that haven't been changed significantly by people.
- They are undeveloped, uninhabitable and undisturbed.
- Large parts of cold environments are wilderness areas

##### **Why are they worth protecting?**

- Scientists can study wild plants and animals in their natural habitat
- They are the last remaining areas that haven't been altered by human activity
- They can be used to compare to managed ecosystems as they are natural

#### **Cold environments are fragile and can take a long time to recover...**

- Cold environments are very fragile and can be interfered with
- Plant growth is very slow - if plants are damaged e.g. by vehicle tyres then they can take a long time to recover
- Species are highly specialised to find it difficult to adapt to change e.g. polar bears are adapted to hunt on ice and their numbers are decreasing as sea ice melts earlier each year.



**Strategies used to balance the needs of economic development and conservation in cold environments:**

**USE OF TECHNOLOGY:**

- Modern construction methods can minimise environmental impacts e,g, elevating buildings on piles or gravel beds can prevent buildings from warming the ground.
- Facebook have located in the Arctic as the cold air cools the generators so not as much energy is used.

**ROLE OF GOVERNMENTS:**

- This can cause conflicts between different interest groups. For example in Alaska, some politicians want to increase oil production to increase income for the country.
- However, Barack Obama anted to maintain the wilderness of the environment. He banned oil exploration from taking place in 12 million acres if the Arctic National Wildlife Refuge.
- The US government has been involved with the protection of Alaska since oil was discovered in the 1960's
- The National Environmental Policy Act ensures companies involved with the extraction and transportation of oil protect and recognise the rights of native people
- The NOAA oversee sustainable fishing and protection of marine habitats
- Just over 10% of the Arctic's land now has some level of special protection and it is the responsibility of the country with hold the claim to that area to look after it ecosystem e.g. National Park. Each country has its own laws
- However these laws are not always followed e.g. Norway continues to hunt for whales

**INTERNATIONAL AGREEMENTS:**

- There has been a global ban on whaling from the International Whaling Convention in 1986 and bowhead whales have increased by 3% since then
- The Treaty of Antarctica was signed in 1959 by countries. It banned mining, drilling extraction of oil and wars on shore.

**CONSERVATION GROUPS:**

- A recent campaign for the native Alaskan against Pebble Mine as it would have been owned by North America. Greenpeace sent campaigners to Russia' Arctic Ocean to protest about oil exploration and the Russian government arrested some members of GP.
- Greenpeace called for 'global sanctuary' to be established in the Arctic by wanting a ban on oil drilling and fishing. However this approach limits indigenous people's freedom to use the Arctic's resources.

# Section C: Physical Landscapes in the UK

**YOU NEED TO PICK THE COASTAL LANDSCAPES IN THE UK AND RIVER LANDSCAPES IN THE UK SECTIONS**

## UK Physical Landscapes:

Relief describes the shape of the land:

- Height above sea level
- Steepness of slopes
- Landscape features e.g. mountain range.

Relief is determined by the land's geology - more resistant types of rocks such as granite will be harder to break down, this is why they tend to form mountain ranges.

In the UK in the **North** there are **highlands** (areas where there are mountains) and in the **South lowlands** (areas where the land is flat).

## Coastal landscapes in the UK

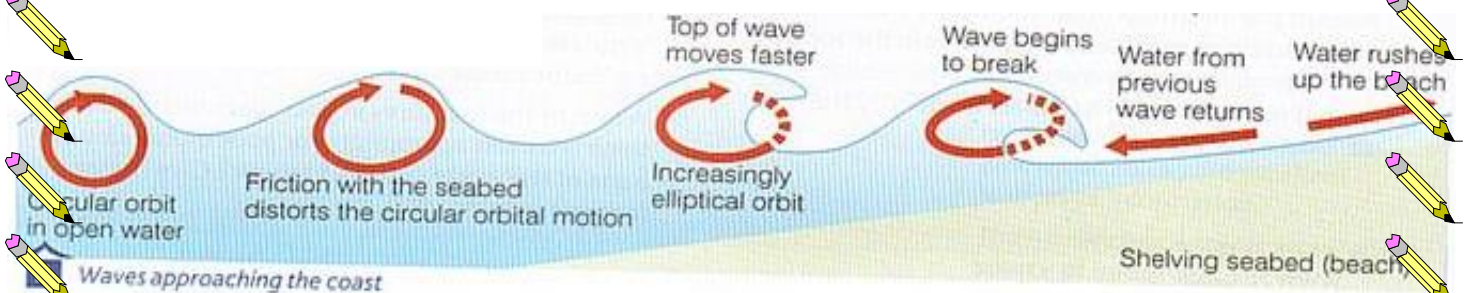
### Wave types and characteristics:

#### **What forms a wave?**

- Waves are formed by wind blowing over the sea.
- The friction between the surface of the water and the wind causes ripples which form into waves.
- The distance the wind travels is called the '**fetch**.'
- The longer the fetch the more powerful the wave.

#### **What happens when a wave reaches the coast?**

- When a wave travels inland, rushing up the beach, it is called a '**SWASH**'
- When a wave travels back towards the sea it is called a '**BACKWASH**'





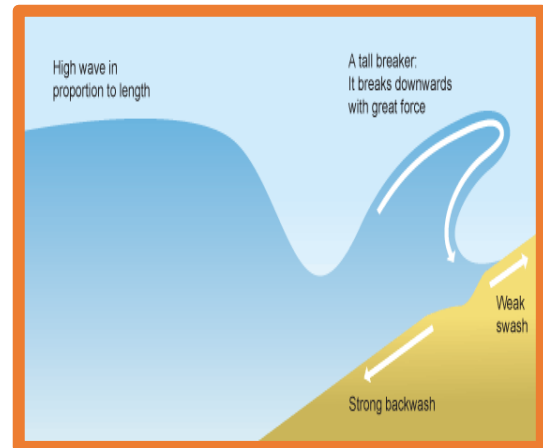
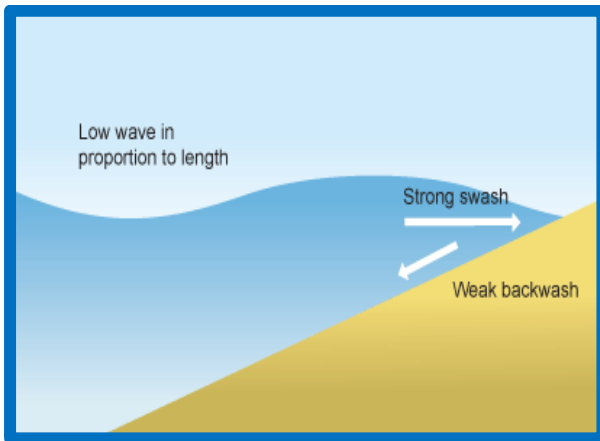
## Types of waves and characteristics:

### CONSTRUCTIVE

- Low wave that surges up the beach
- Powerful swash, weak backwash
- This type of wave 'spills' onto the beach
- Deposit large amounts of sand and pebbles
- Powerful swash, weak backwash

### DESTRUCTIVE

- Weak swash, strong backwash
- Formed by storms close to the coast
- High frequency (10-14 waves per min)
- Destroys beaches - removes sand and pebbles.
- Destroys beaches - removes sand and pebbles.
- Formed by storms close to the coast



## Coastal processes:

### 1) Weathering

Type of weathering	Cause	Description
Biological	Plants and animals breaking down the rock.	Plant roots grow in cracks in the rocks. Forcing them apart. Animals such as rabbits burrow into weak rocks such as sands forcing the rocks apart.
Chemical (Carbonation)	Rainwater absorbs CO <sub>2</sub> and becomes acidic.	Contact with <i>alkaline</i> rocks such as chalk and limestone produces a <i>chemical reaction</i> causing the <i>rocks to slowly dissolve</i> .
Mechanical (freeze-thaw)	Water collects in cracks, freezes, expands and melts.	After <i>repeated</i> freezing (night) and <i>thawing</i> (day), <i>fragments</i> of rock may <i>break</i> off and fall to the foot of the <i>cliff</i> (scree).
Mechanical (Salt weathering)	Water evaporates leaving behind salt crystals.	Seawater contains <i>salt</i> . When the water <i>evaporates</i> it leaves behind salt <i>crystals</i> . In cracks and holes these <i>salt crystals</i> grow and <i>expand</i> . This puts pressure on the <i>rocks</i> and <i>flakes</i> may eventually break off.

### 2) Mass movement:

What is mass movement?

**Movement downslope of any loose material (soil, mud, loose rock) under the influence of gravity.**

#### Causes of mass movement:

**Steep gradient**

**Water content (lots of water)**

**Human activity (puts pressure on the land)**

**Lack of vegetation**

### Types of mass movement:

#### **ROCKFALL:**

Bare rocks are prone to freeze-thaw weathering, which results in individual rocks breaking off the cliff face. On vertical cliffs, due to gravity they fall. At the bottom of the cliff they fan out to form scree.

#### **MUDFLOW:**

Mudflows are often rapid and occur when slopes are steep ( $10^\circ$ ). They usually occur after heavy rainfall. There is little vegetation so cannot hold the soil together. At the base, the soil forms a lobe.

#### **LANDSLIDE:**

A landslide is when a large amount of rock blocks slide down a cliff. This happens along a fairly steep slide plane, where rocks maintain contact with the cliff. These collect as a pile of rocks at the bottom of the cliff.

#### **ROTATIONAL SLIP:**

A slump of saturated soil or weak rock along a curved slip plane. When material slumps, it is rotated backwards into the cliff face as it slips.

### **3) Erosional processes: The wearing away of the coastline**

**Hydraulic power** = Powerful destructive waves smash into the base of the cliff. Water is forced in and out of the cracks in the rock. Air pressure changes as waves go in and as they go out, pressure is released causing the rock to break apart. This is called cavitation. This process is aided by weathering.

**Abrasion (corrasion)** = Destructive waves hurl rocks at a cliff. They scrape the rocks like sand paper on the cliff, causing it to become smoother and is more erosive in storm conditions.

**Attrition** = Rocks carried by the sea knock against one another causing them to become smaller and more rounded

#### **Rates of erosion will be higher where**

- The coastline is exposed to a large fetch (area of water wind can blow over to create a wave)
- Stronger winds
- There are soft rocks

### **4) Transportation = the movement of material on the coast**

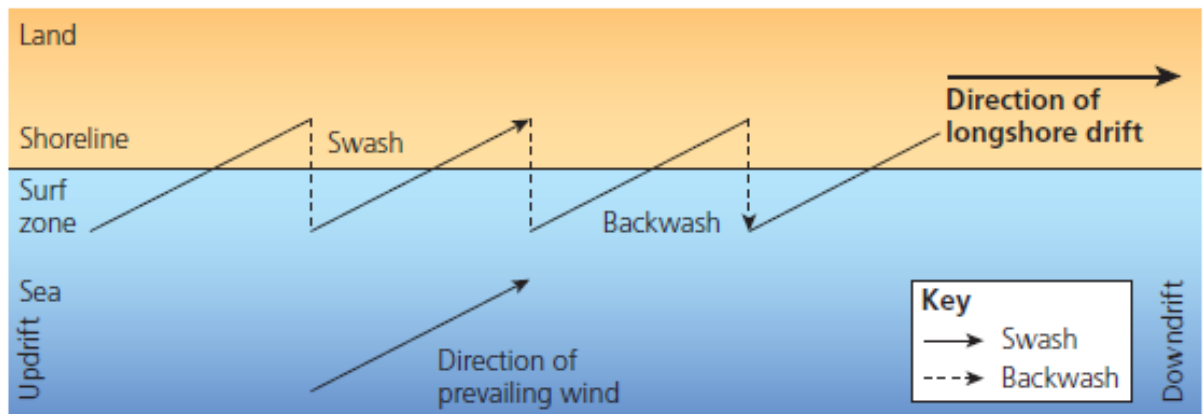
**Traction** - Large pebbles rolled along the seabed

**Saltation** - A 'hopping' or 'bouncing' motion of particles too heavy to be suspended

**Suspension** - Particles carried (suspended) within the water

**Solution** - Dissolved chemicals often derived from limestone or chalk

**Longshore drift = Longshore drift is the movement of material along a beach by wave action**



- 1) The swash moves in the same direction as the prevailing wind
- 2) Backwash goes back to the sea at a 90 degree angle due to gravity
- 3) This process is repeated to create a zigzag movement of material along a beach

**5) Deposition - the dropping of material at the coast due to:**

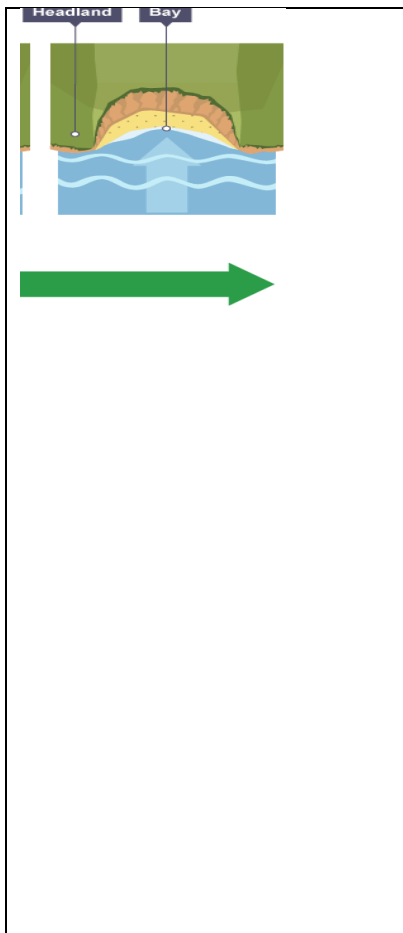
- Loss of energy
- Mainly constructive waves
- Large flat beaches so the swash spread over a large area
- Material gets trapped behind a spit or engineered structures e.g. groynes

**Distinctive coastal landforms are the result of rock type, structure and physical process**

\*The geology (rock type) affects the coast as if the area is made of soft rock then it will erode very quickly\*

**CHARACTERISTICS AND FORMATION OF LANDFORMS RESULTING FROM EROSION**

LANDFORM	CHARACTERISTICS	FORMATION
HEADLANDS AND BAYS	<ul style="list-style-type: none"> <li>• Headlands and bays happen at DISCORDANT coastlines.</li> <li>• This means there are bands of hard and soft rock that</li> </ul>	<ol style="list-style-type: none"> <li>1. There is a discordant coastline where there is hard rock (e.g. sandstone and chalk) and soft rock (e.g. clay). The waves start to attack it</li> </ol>



meet at right angles to the coast.

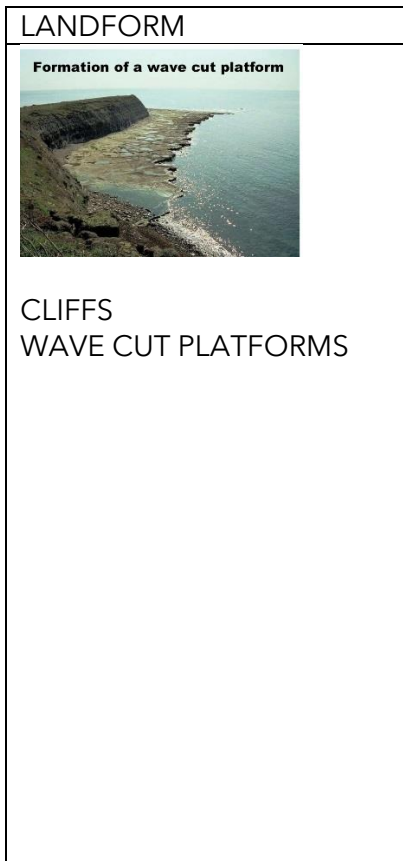
**Headlands:**

- It is a cliff that juts out into the sea surrounded by water on three sides.
- Made of hard rock, such as granite, chalk or limestone.
- They have near vertical cliff faces.

**Bays:**

- They are crescent shaped and are found between two headlands due to the erosion of soft rock, such as clay.
- They have a beach made of sand or shingle.
- They have low energy constructive waves making them.

2. The waves start differential erosion. The soft rock is eroded by hydraulic action and attrition.
3. The less resistant soft rock is eroded at a faster rate which causes a bay to form.
4. The hard, resistant rock forms a headland that sticks out into sea.
5. Sand is deposited into the bay to form a beach.



CHARACTERISTICS

Cliffs

1. Made of sandstone
2. Horizontal bedding
3. Rocks at the base

Wave cut platforms

1. Deep cracks in the rocks
2. Slope down to the sea at 3-4° angle
3. Smooth rock due to attrition
4. Covered at high tide and exposed at low tide.

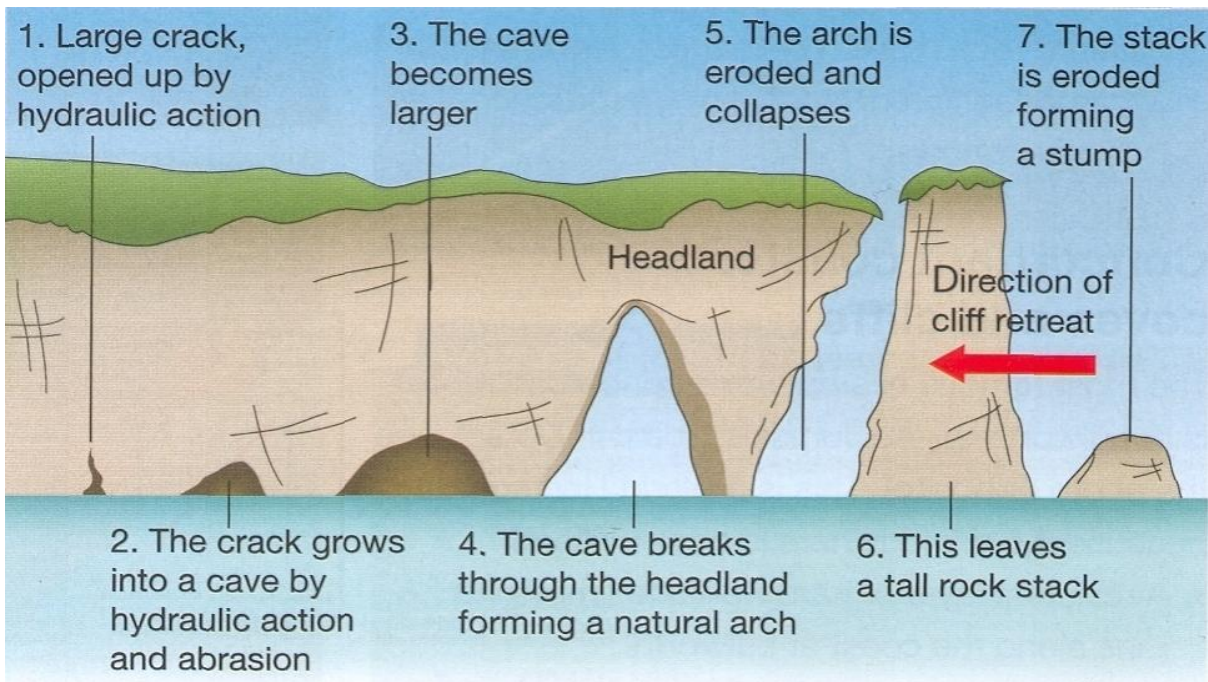
FORMATION

1. Freeze-thaw weathering weakens the upper part of the cliff.
2. Waves cause most erosion at the foot of the cliff, undercutting it through hydraulic action and abrasion. This forms a wave-cut notch, which is enlarged as erosion continues.
3. This makes the cliff above the notch unstable and it eventually collapses.
4. The collapsed material is washed away by destructive waves and a new wave-cut notch starts to form.
5. Repeating collapsing results in the cliff retreating.
6. A wave-cut platform is the platform that's left



		behind as the cliff retreats. This will be continuously smoothed by shingle grinding over it.
--	--	---

**HEADLAND, CAVE, ARCH, STACK AND STUMP:**



Headland = Reistant rock e.g. chalk

Cave = Can be made of limestone and are very dark

Arch = Very tall ceiling

Stack - Isolated rock in the sea

Stump = Very small

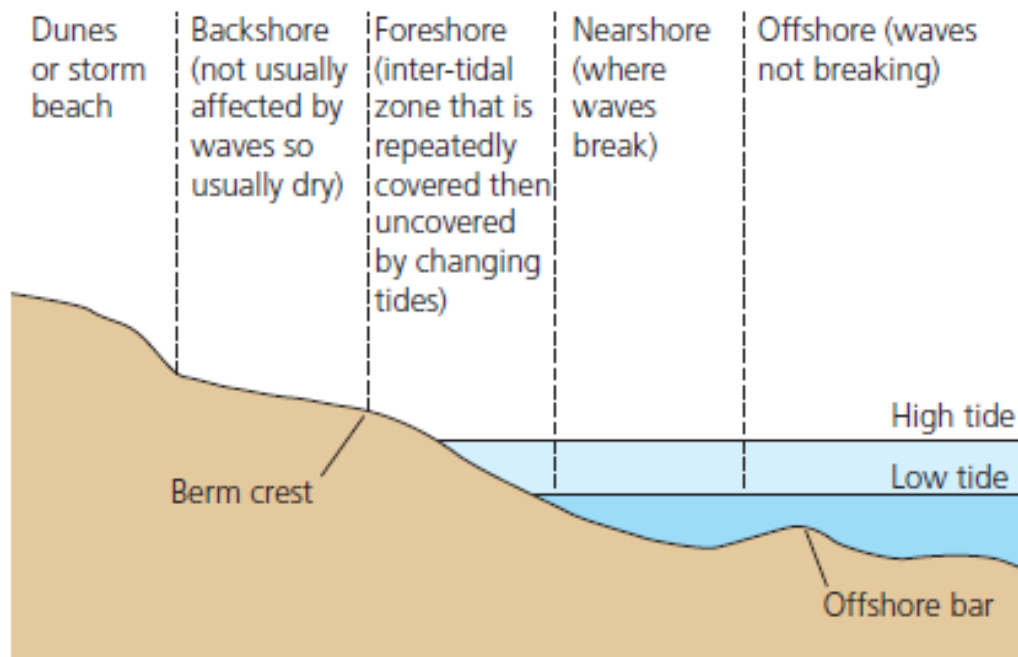
**CHARACTERISTICS AND FORMATION OF LANDFORMS RESULTING FROM EROSION**

**1) BEACHES**

**Characteristics of beaches:**

PEBBLE	SANDY
Steep because the weak backwash can't move material down the beach Destructive waves Large pebbles at the back	Almost flat because the backwash moves the sand back down the beach creating a gentle slope. Constructive waves Wet sand, rippled appearance look

Beach profiles:



### **Formation:**

**SANDY BEACH:** In sheltered bays, low energy constructive waves transport material onto the shore. The swash is stronger than the backwash, so sediment is slowly moved up the beach. Once the tide has gone out, there is more sediment on the beach than before.

**PEBBLE BEACH:** Exposed beaches have a large fetch. The destructive waves have a stronger backwash so pebbles are not moved far up the beach, making a steep profile. A storm beach may form when there is stormy weather and waves hurl large pebbles to the back of the beach.

### **How do beaches change throughout the seasons?**

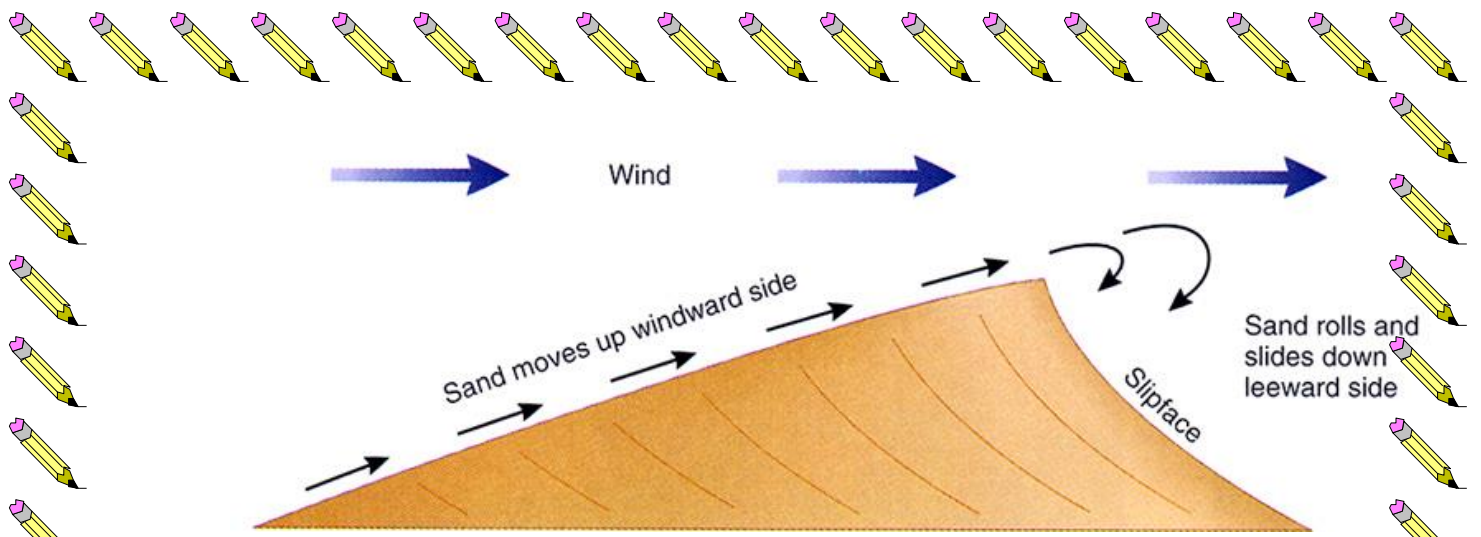
- **WINTER = berms and sand dunes at the back of the beach are eroded by destructive waves which drag beach deposits offshore. This creates an offshore bar which LOWERS the beach.**
- **WINTER = Winter profiles are narrower and steeper.**
- **SUMMER = Constructive waves rebuild the beach.**

### **2) SAND DUNES:**

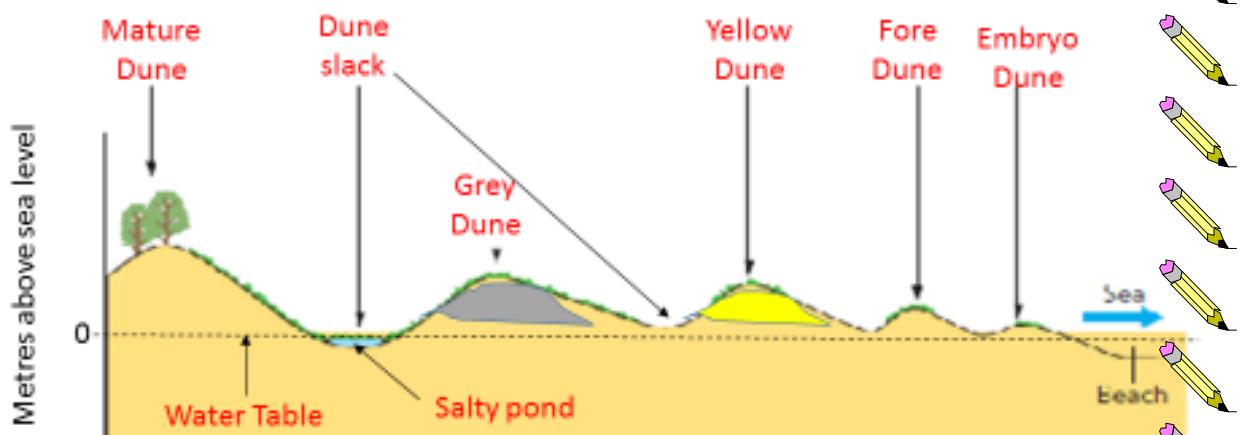
#### **Characteristics:**

1. Unstable steep slope (30-34°)
2. Crests (heights of 15m)
3. Gentle slope on the windward side





### How do sand dune change inland?



### MY DOG SAMMY GOES YAPPY FOR EXERCISE

#### Characteristics and key points:

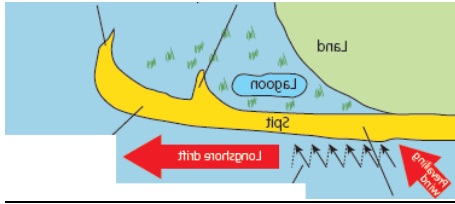
- Embryo dunes only a few metres high but mature dunes can be up to 15m high.
- The dunes get bigger towards the back of the beach because the marram grass is long and binds the vegetation roots together so it cannot move any further.
- Dunes close to the beach are yellow, whereas dunes at the back of the beach are grey.

#### How are sand dunes formed?

- 1) Wind is blown inland by onshore winds.
- 2) Large obstacles, such as driftwood, along the beach cause the grains of sand to become trapped. The heavy grains will build up behind them, but the lighter grains may be transported over the obstacle and settle on the other side.
- 3) The sand cannot continue to build in height because it becomes unstable and collapses under its own weight. The top is called the crest.
- 4) When this happens, the lighter grains fall down the leeward side.
- 5) The cycle repeats, with wind blowing up the windward side and slipping down the leeward side causing the sand dune to migrate inland over time.

### 3) SPITS AND BARS:

#### **SPIT**



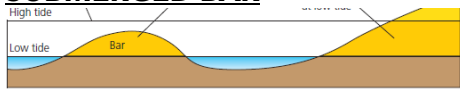
#### **Characteristic:**

- This land form has a hooked end.
- Large pebbles can be found where it is attached to the land and smaller ones further out.
- It is created by longshore drift and is covered in salt marshes and mud flats

#### **FORMATION:**

As a wave approaches a sharp bend in the coastline it loses energy so deposits material. Longshore drift causes the sand and shingle to move past the bend parallel to the land, out to sea and deposits the material in the sea. Strong winds and waves can curve the end of the spit (forming a recurved end). The sheltered area behind the spit is protected from the waves and lots of material accumulates to form a salt marsh.

#### **SUBMERGED BAR**



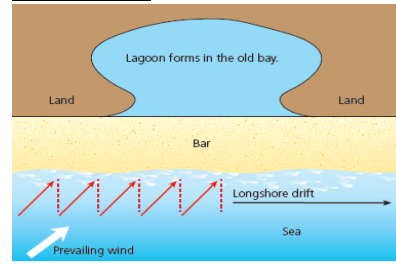
#### **Characteristic:**

- This landform is not attached to the land and runs parallel to the land.
- It is several metres long

#### **FORMATION:**

They form in shallow waters where there is a lot of sediment on a raised seabed. During a storm, material is taken from an offshore barrier out to sea via destructive waves. Constructive waves bring the material back.

#### **BAY BAR:**



#### **Characteristic:**

This landform is visible at all times and is attached to the land

#### **FORMATION:**

A bar is formed when a spit joins two headlands together. The bar cuts off the bay between the headlands from the sea. Longshore drift moves sediment from one side of the bay to the other. This eventually reaches the other side to form a ridge of sand and a lagoon forms behind the bar.

#### **OFFSHORE BARRIER ISLAND**



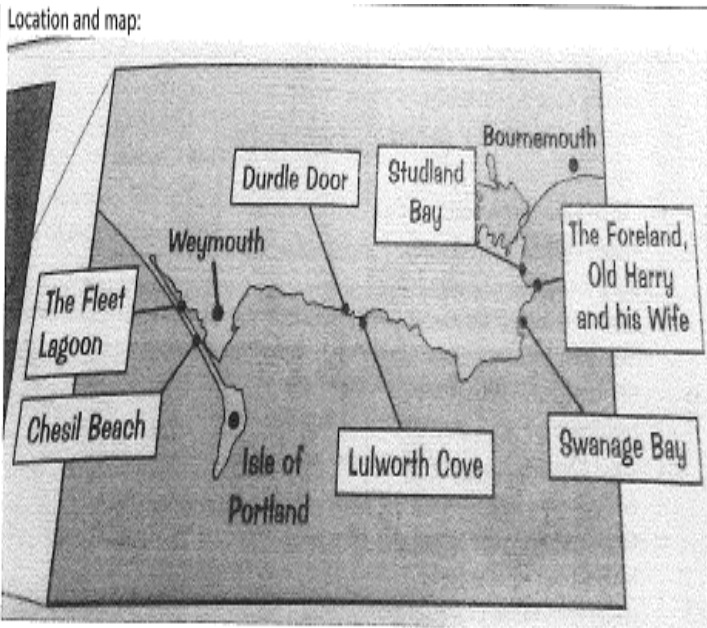
#### **Characteristic:**

- This landform is not attached to the land and runs parallel to the land.
- It is covered in salt marshes, and dunes and mud flats

#### **FORMATION:**

These are visible offshore bars which often form in chains when waves take sand out to sea. They can be made onshore (barrier beach) by ice melt.

**An example of a section of coastline in the UK to identify its major landforms of erosion and deposition = JURASSIC COAST**




- DURDLE DOOR = ARCH
- CHESIL BEACH = LAGOON
- LULWORTH COVE = BAY
- OLD HARRY = STACK
- OLD HARRY'S WIFE = STUMP
- SWANAGE BAY = BAY AND HEADLAND




**Different management strategies can be used to protect the coastlines from the effects of physical processes:**

There are 3 types of management used to defend the coast:



1. Hard engineering - artificial structure e.g., sea wall
2. Soft engineering - more environmentally friendly method e.g. beach nourishment
3. Managed retreat - allowing the sea to flood over low-lying land

<b>HARD ENGINEERING</b>	WHAT IS IT	☺ AND ☹
<p>SEA WALL</p> 	<p>It is a concrete or rock barrier against the sea. It is placed at the foot of cliffs or the top of a beach. It has a curved face to reflect the waves back into the sea.</p>	<p>☺ The sea walls can last for years which is good economically                      ☺ Often has a promenade for people to walk along                      ☺ They do not stop longshore drift so they don't disadvantage other beaches                      ☹ £10,000 per metre                      ☹ Can look ugly and they can stop people getting to the beach.</p>



		<ul style="list-style-type: none"> <li>⊗Very expensive to build and repairs are expensive.</li> </ul>
<p>GROYNES</p> 	<p>They are timber or rock structures built out to sea from the coast. They trap sediment being moved by longshore drift and enlarge the beach. The wider beach acts as a buffer to reduce wave damage.</p>	<ul style="list-style-type: none"> <li>⊙Creates a wider beach, which can be popular with tourists.</li> <li>⊙Provide useful structures for people interested in fishing.</li> <li>⊙Last for 40 years</li> <li>⊗£150,000</li> <li>⊗It stops longshore drift which can reduce sand on beaches</li> <li>⊗They are unnatural and unattractive</li> </ul>
<p>ROCK ARMOUR</p> 	<p>Piles of large boulders dumped at the foot of a cliff. The rocks force waves to break which absorbs the energy and protects the cliffs. The rocks are brought by barge to the coast.</p>	<ul style="list-style-type: none"> <li>⊙They are cheap and easy to maintain</li> <li>⊙They can be built in months rather than years.</li> <li>⊙ Can be used for fishing</li> <li>⊗ Rocks are usually used from other parts of the coastline or abroad e.g. Norway. Other countries can get annoyed about this.</li> <li>⊗They can be a hazard for people getting to the beach.</li> <li>⊗Do not fit in with the local geology (rocks)</li> </ul>
<p>GABIONS</p> 	<p>Wire cages filled with rocks that can be built up to support a cliff or provide a buffer against the sea.</p>	<ul style="list-style-type: none"> <li>⊙Cheap to produce and it uses local pebbles.</li> <li>⊙They can last for 20-25 years.</li> <li>⊙Will eventually become vegetated (plants will grow there) and it will become part of the landscape</li> <li>⊗They can cost £30,000 to repair.</li> <li>⊗Cages only last 5-10 years before they rust and sea birds might trap their feet in them.</li> </ul>

		⊗ Damaged gabions are unattractive and people might cut themselves.
--	--	---

SOFT ENGINEERING	WHAT IS IT	⊙ and ⊗
BEACH NOURISHMENT AND REPROFILING 	Adding sand/shingle to a beach to make it wider or higher.	⊙ Relatively cheap and easy to maintain - £5000 ⊙ Blends in with beach ⊙ Could increase tourism ⊗ Needs maintenance unless structures are built to retain the beach like groyne. ⊗ Not that effective against high energy waves ⊗ Taking material from the seabed can destroy coral
DUNE REGENERATION 	Encouraging the creation and growth of sand dunes by planting marram grass.	⊙ Maintains a natural coastal environment (attracts tourists and wildlife) ⊙ Relatively cheap - £200 ⊙ Wave energy is absorbed which stops flooding ⊗ Time consuming to plant the marram grass ⊗ Can be damaged by storms ⊗ Protection is limited to a small area

## MANAGED RETREAT/ DO NOTHING



Managed retreat is when the sea is allowed to flood or erode an area of low-value land.

☺ It may reduce the risk of flooding further down the coast.

☺ It is cheaper to use than any other strategy.

☺ It conserves and enhances the environment e.g. at Wallasey 38 species of bird have been recorded.

☹ Houses and roads are destroyed which costs money to build new ones elsewhere.

☹ When some areas are destroyed then some habitats can be ruined.

☹ Causes conflicts with landowners

## An example of a coastal management scheme in the UK = MEDMERRY IN SUSSEX:

### Reasons for the scheme:

- The scheme was needed as the area was considered to be at high risk of flooding due to the climate change.
- Before the management scheme, they only had a shingle ridge for protection which cost £200,000 to repair every winter.
- 348 homes, a water treatment plant and a main road to Chichester could be destroyed without any protection.
- The last breach cost the government £5 million damage in 2008

### Management strategy:

A new embankment was built, 2km from the shore which protected the houses behind it. A channel behind the embankment was built to take water away from the area. 60,000 tonnes of rock armour was placed near the sea. 110m breach was made in the shingle bank to allow the sea to flood the land. The Environment Agency built a 7km flood embankment.

### Resulting effects and conflicts:

- ✓ They built a new cycle route and 10km of footpaths
- ✓ Selsey now has a 1 in 1000 chance of flooding which is the best level of protection in the UK
- ✓ Tourism in the area has increased and bird watchers come to the RSPB reserve

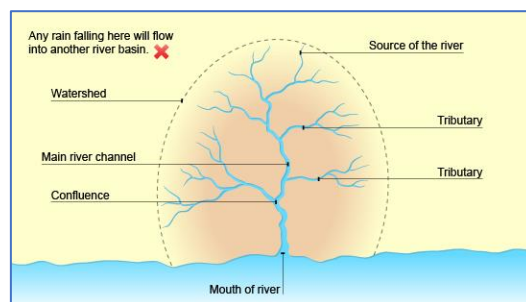


- ✓ Flooding is now planned so species like water voles are protected and 300 intertidal habitats are forming
- ✓ Newly flooded area will become a fishing nursery to boost fisherman's income
- X Three wheat and rapeseed farms were destroyed
- X Badgers habitats have been destroyed
- X Not many people live in this area
- X Cost of £28 million

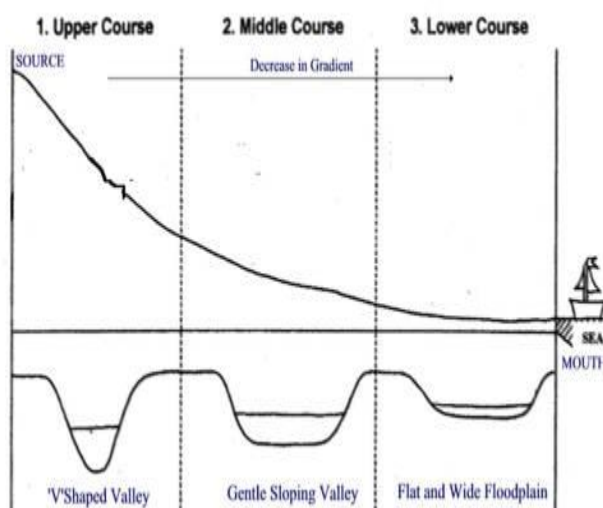
## River landscapes in the UK

### Key words:

- Drainage basin: an area of land drained by a rivers and its tributaries.
- Source: the start of a river.
- Watershed: the edge of a river basin.
- Tributary: a small stream that joins a larger river.
- Confluence: where a tributary joins a larger river.
- Mouth: the end of a river, usually where a river joins the sea.



### The long and cross profile of a river



### LANDFORMS FOUND:

<b>Upper course landforms</b>	<b>Waterfalls, interlocking spurs and gorges</b>
<b>Middle course landforms</b>	<b>Meanders and oxbow lakes</b>
<b>Lower course landforms</b>	<b>Oxbow lakes, levees, estuaries and floodplains</b>



## The changing long cross profile of a river and its valley:

- 1) The path of a river flows downhill to its course
- 2) Rivers have an upper course, a middle course and a lower course
- 3) Rivers erode channels as they flow downhill
- 4) Rivers erode the landscape and transport material to where it is deposited
- 5) The shape of the valley and channel changes along a river depending on whether erosion or deposition has the most impact.
- 6) **The long profile of a river shows you how the gradient (steepness) changes over the different courses.**
- 7) **The cross profile shows you what a cross-section of the river looks like (see above).**

### The long profile changes downstream:

The upper course of the river has steep relief so the gradient of the valleys is also steep. There is only one channel with a steep descent so there is a lot of potential energy. The middle course has an increase in tributaries (other smaller rivers joining one larger river). Energy also increases due to more lateral erosion occurring. The shape is now concave due to less vertical erosion. The lower course has low lying land and the erosion is lateral so the valley is almost flat.

### The cross profile changes downstream:

The upper course has a lot of vertical erosion and the type of rock is hard rock so less erosion occurs here. This is why the channel is thinner and not very wide. The middle and lower course have softer rock and lateral erosion occurs here which is why the channel gets wider.

### Summary table:

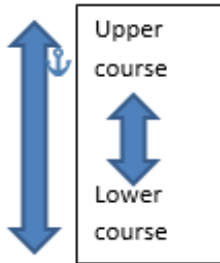
<u>UPPER COURSE</u>	<u>MIDDLE COURSE</u>	<u>LOWER COURSE</u>
-Steep gradient -V Shaped Valley -Steep sides -Narrow and shallow channel -Vertical erosion	-Medium gradient -Gently sloping valley sides -Wider, deeper channel -U Shaped Valley -Lateral erosion	-Very wide -Almost flat valley -U Shaped Valley -Very wide, deep channel -Lateral erosion

### Two types of erosion:

- 1) **Vertical:** This is erosion downwards that deepens the river valley (and channel), making it V-shaped. It's dominant in the upper course of the river.
- 2) **Lateral:** This is erosion sideways that widens the valley in the middle and lower course.

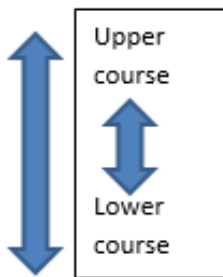
## Fluvial processes:

**Erosion** - The wearing away of rock and soil from the bed and banks and the breaking up of material in the river



<b>Hydraulic action</b>	Sheer force of the water hitting the bed and banks (going into the cracks and breaking it up)
<b>Abrasion</b>	Rocks hitting the bed and banks
<b>Attrition</b>	Rocks smashing into each other breaking themselves up
<b>Solution</b>	Small particles which have dissolved

**Transportation** - The picking up and movement of rocks and particles down a river



<b>Traction</b>	Big boulders are rolled along the river bed
<b>Saltation</b>	Rocks leap frog over each other
<b>Suspension</b>	Rocks are held up within the river and float along
<b>Solution</b>	Rocks are dissolved and move along in the water

## **Deposition:**

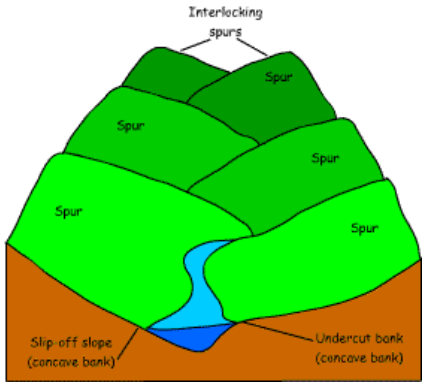

- To carry a bigger load a river has to have a lot of energy (flowing fast)
- When a river slows down it has less energy and has to drop heavier parts of its load
- The dropping of some of the load due to a loss of energy is called deposition

## **In general on a river:**

- Upper course - mostly erosion
- Middle course - erosion, transportation and deposition
- Lower course - deposition

**Distinctive fluvial landforms result from different physical processes:**

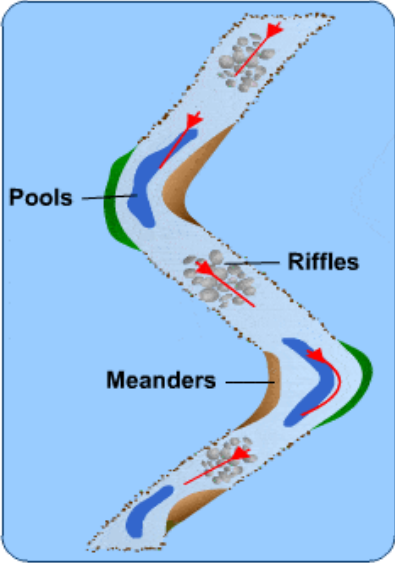
**CHARACTERISTICS AND FORMATION OF LANDFORMS RESULTING FROM EROSION**

LANDFORM	CHARACTERISTIC	FORMATION
<p data-bbox="201 349 520 383">INTERLOCKING SPURS</p> 	<p data-bbox="807 349 1074 421">Found in the upper course of a river.</p> <p data-bbox="807 456 1066 528">They look like a zip from above</p>	<ol style="list-style-type: none"> <li data-bbox="1166 349 1385 703">1) In the upper course of a river most of the erosion is vertical. This creates a steep sided v shaped valley.</li> <li data-bbox="1166 703 1385 1196">2) The rivers aren't powerful enough to erode laterally so they have to wind around high hillsides that stick out into their paths on either side.</li> <li data-bbox="1166 1196 1385 1518">3) The hillsides interlock with each other as the river winds around them = interlocking spurs.</li> </ol>
<p data-bbox="201 1592 611 1626"><b>WATERFALLS AND GORGES</b></p> 	<ul style="list-style-type: none"> <li data-bbox="858 1592 1070 1664">• Very narrow valley</li> <li data-bbox="858 1664 1062 1771">• Turbulent, fast flowing white water</li> <li data-bbox="858 1771 1090 1879">• Areas of bare rock on the valley sides</li> </ul> <p data-bbox="807 1946 1019 2018">E.g. High Force Waterfall</p>	<ol style="list-style-type: none"> <li data-bbox="1118 1592 1377 1736">1) Layer of hard, resistant rock lies on top of a layer of softer rock</li> <li data-bbox="1118 1736 1385 1984">2) The river's load erodes (by hydraulic action and abrasion) the foot of the waterfall. This forms a plunge pool.</li> </ol>

3)The soft rock is eroded more quickly, undercutting the hard rock to form an overhang. This overhang eventually collapses under its own weight.

4)Over many years this process is repeated many times and the waterfall retreats upstream leaving behind a steep-sided valley called a gorge.

**CHARACTERISTICS AND FORMATIONS OF LANDFORMS RESULTING FROM EROSION AND DEPOSITION**

LANDFORM	CHARACTERISTICS	FORMATION
<p>MEANDERS</p> 	<p>Meanders are wide bends of a river found mainly in lowland areas.</p> <p>They constantly change their shape and position because of LATERAL erosion and deposition.</p>	<ol style="list-style-type: none"> <li>1) The current (flow of the water) is faster on the outside of the bend because the river channel is deeper and there is less friction to slow the river down.</li> <li>2) So more erosion takes place on the outside of the bend forming a river cliff.</li> <li>3) The current is slower on the inside bend because the river channel is shallower and there is more friction to slow it down.</li> </ol>

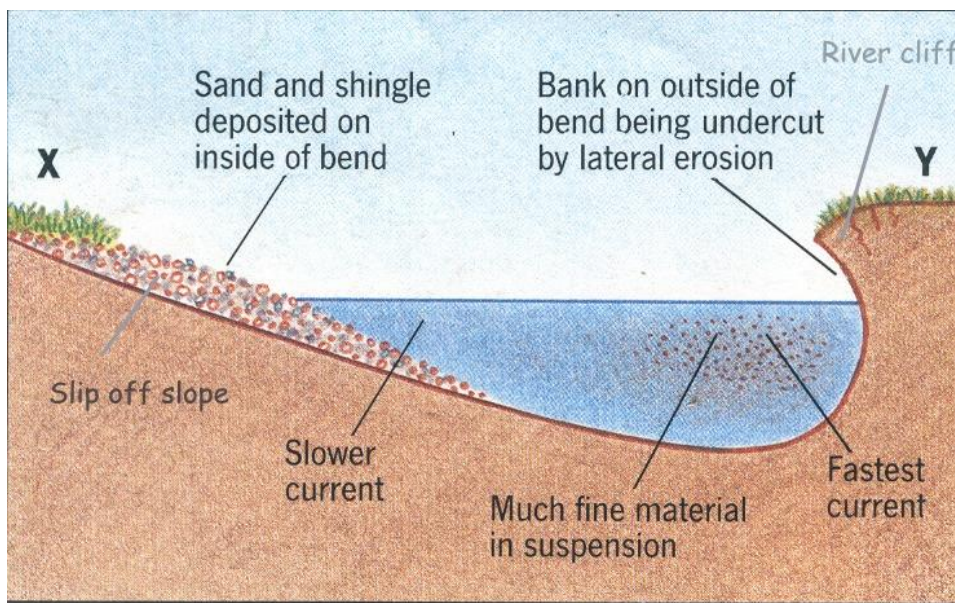


4) The eroded material is deposited on the inside of the bend = slip-off slope.

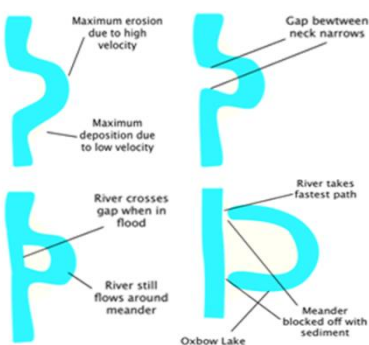
**Riffle:** areas of shallow, fast flowing water with coarse sediment. These form between meander bends because of a drop in velocity resulting in deposition.

**Pool:** Deeper, slower moving water

**You need to learn the cross-section of a meander:**



**OXBOW LAKE**



A horse shoe shaped lake that marks where the meander neck got cut off from the river channel.

An oxbow lake once started life as a meander.

Oxbow lakes start eroding the outside of the meander bend where there is the **fastest** flow.

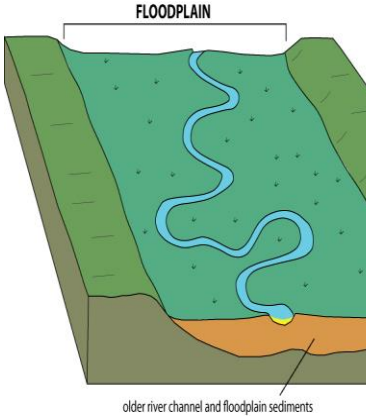
Outside bends become closer as the neck of the meander becomes narrower.

The river breaks through this land

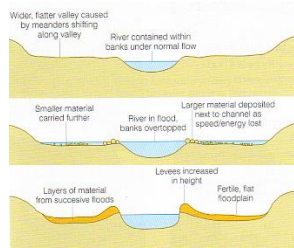


		<p>during a flood and the river takes the fastest route.</p> <p>Deposition eventually cuts of the meander neck and leaves a horseshoe shaped oxbow lake.</p>
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**CHARACTERISTICS AND FORMATIONS OF LANDFORMS RESULTING FROM DEPOSITION**

LANDFORM	CHARACTERISTICS	FORMATION
<p>FLOODPLAIN</p> 	<p>This is the wide valley floor on either side of the river which occasionally gets flooded.</p> <p>May contain reeds and marshes.</p>	<ol style="list-style-type: none"> <li>1. When a river floods onto the floodplain, the water slows down and deposits the eroded material that it's transporting. This builds up the floodplain (makes it higher).</li> <li>2. Meanders migrate (move) across the floodplain making it wider.</li> <li>3. The deposition that happens on the slip-off slopes of the meanders also builds up the floodplain.</li> </ol>

## LEVEES



- Raised river banks (2-8m high)
- Made of gravel and stones
- Steep-sided

1. These are natural embankments (raised bits) along the edges of a river channel.
2. During a flood, eroded material is deposited over the whole floodplain.
3. The heaviest material is deposited closest to the river channel because it gets dropped first when the river slows down.
4. Over time, the deposited material builds up, creating levees along the edges of the channel.

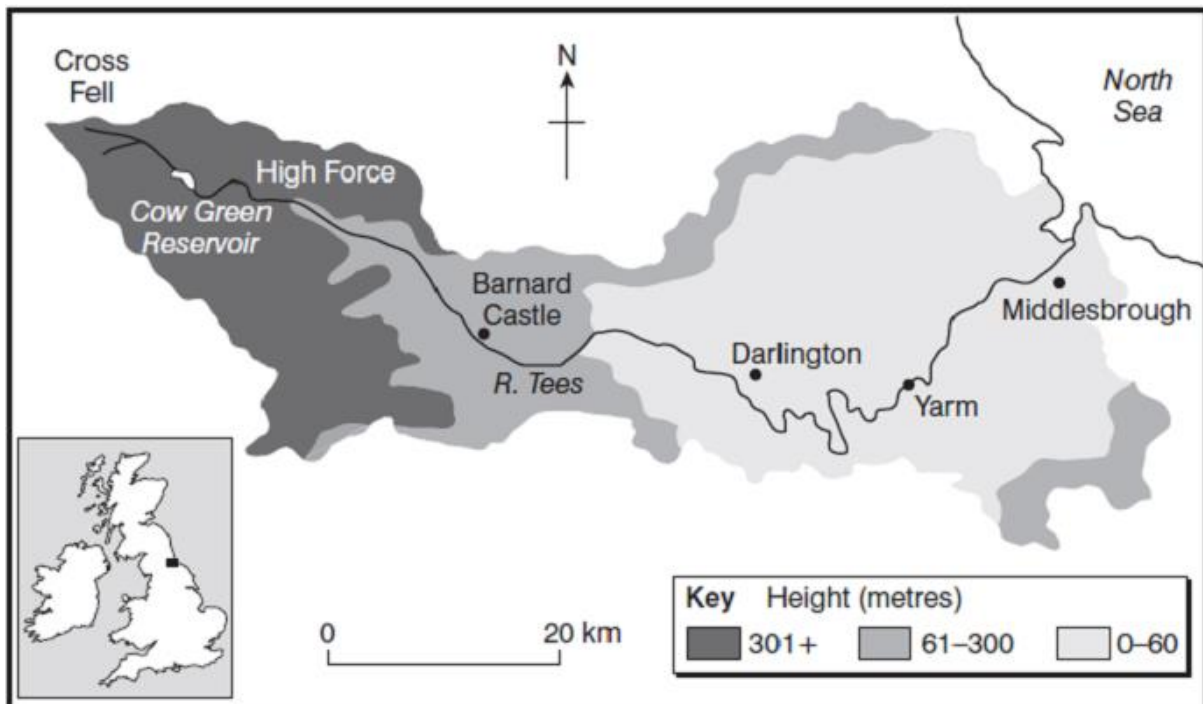
## ESTUARIES



→ Estuaries form when rivers meet the sea  
 → Rivers near their mouth have a large amount of load causing the river to slow down and lose energy  
 → If the rate of deposition is greater than the rate of erosion by the sea then sediment will be deposited

- 1) Estuaries are found at the mouth of the river where it meets the sea.
- 2) The water is tidal and the river level rises and falls each day.
- 3) The water floods over the banks of the river carrying silt and sand onto the valley floor.
- 4) As the tide reaches the highest point, the water is moving very slowly so the sediment is deposited.
- 5) Over time more and more mud builds up creating large mudflats
- 6) At low tide the wide muddy banks are exposed.

**An example of a river valley in the UK to identify its major landforms of erosion and deposition = THE RIVER TEES**



HIGH FORCE = WATERFALL AND GORGE

YARM - MEANDER, LEVEES AND FLOODPLAINS

MIDDLESBOROUGH = ESTUARY

**Flooding**

A river flood occurs when a river channel can no longer hold the amount of water flowing in it so overlaps the banks onto the adjacent land (floodplain).

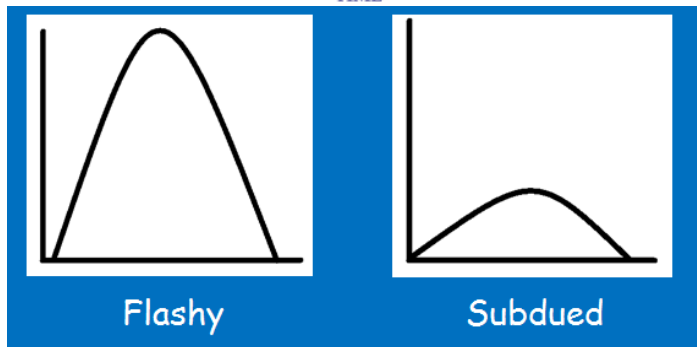
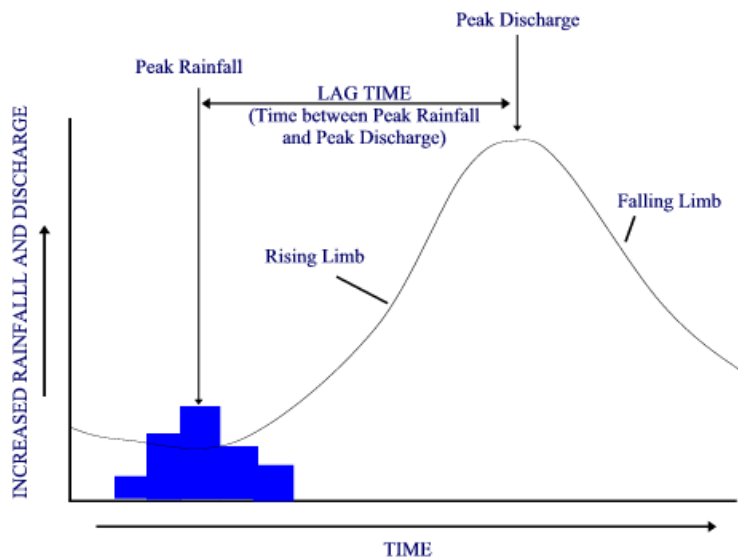
**PHYSICAL FACTORS**

1. **Heavy precipitation** - leads to flash floods as the river channel cannot contain the volume of water.
2. **Geology** - impermeable rocks (shale/clay) prevents water soaking through so it remains on the surface and directs the water to the river.
3. **Relief** - steep slopes/mountainous environments causes the water to runoff the surface into the river.

**HUMAN FACTORS**

1. **Urbanisation** - building on a floodplain creates impermeable surfaces (tarmac roads) means water cannot infiltrate into the ground. Drains can also block.
2. **Deforestation** - reduces the amount of evapotranspiration so there is more water on the surface and in the river channel.
3. **Agriculture** - loose soil is moved into rivers through surface runoff.

## The use of hydrographs to show the relationship between precipitation and discharge:



**Base flow** - The normal day to day discharge of the river

**Peak discharge** - the point when river discharge is at its greatest.

**Peak rainfall** - the point when rainfall is at its greatest.

**Lag time** - period of time between the peak rainfall and peak discharge.

**Rising limb** - amount of water in a river starts to rise

**Falling limb** - amount of water in a river starts to decrease

**Discharge** = Volume of water in the river

**Precipitation** = Rain

### CAUSES OF EACH HYDROGRAPH:

Flashy - Lots of deforestation, impermeable rocks, saturated soils, lots of rainfall.

Subdued - Afforestation, permeable rocks, unsaturated soils, calm rainfall

### Key words to use in a flooding question:

- 1) Surface run off - Water runs back to the river channel e.g. over concrete
- 2) Saturated soil - Lots of water in it
- 3) Impermeable rock - Rock that lets water into it
- 4) Interception - When trees leaves take in rainfall
- 5) Infiltration - When water soaks into soil
- 6) Percolation = When water soaks into rock

## The costs and benefits of flood management strategies

### Two types of flood management:

**Hard engineering** - using man-made structures to prevent or control natural processes from taking place. Usually expensive.

**Soft engineering** - working with natural river processes to manage the flood risk. Aims to reduce/slow down the movement of water into a river channel to prevent flooding.

### Hard engineering:

STRATEGY	HOW IT WORKS	☺ and ☹
<p>DAMS AND RESERVOIRS</p> 	<p>A dam is a large concrete barrier that is built across a river to slow its flow. This causes the valley behind a dam to flood and form an artificial lake called a reservoir. This stops water going downstream and water can be released through flood gates slowly to go downstream. This reduces the risk of flooding.</p>	<p>☹ Dams are very expensive - Kielder Water cost £167 billion                      ☹ The flooding of a valley (to form a reservoir) can cause people to lose their homes. 58 people lost their homes at Kielder Water.                      ☹ Reservoirs can stop the natural migration (moving) of fish downstream                      ☺ Can use the reservoir for HEP e.g. can provide power for 10,000 people                      ☺ Very effective at reducing the risk of flooding                      ☺ Boosts tourism - £6 million at Kielder Water each year.</p>
<p>CHANNEL STRAIGHTENING</p>	<p>Channel straightening is when a meandering (winding) section of the river is made wider, straighter and deeper. They sometimes line the river with concrete to</p>	<p>☺ Flooding risk is lower so insurance is lower for people                      ☺ Animals get new habitats                      ☺ Allows water to move quicker which reduces flooding upstream.</p>



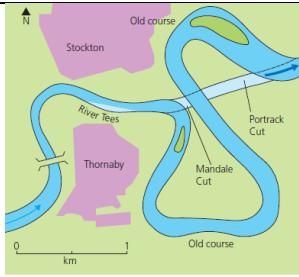


Figure 11.46 Straightening the River Tees

speed up the flow and prevent the banks from collapsing. This means that water can flow through it faster and more easily. This reduces the risk of flooding.

- ⊗ When the river meets a meander downstream it floods houses.
- ⊗ Cost £110 million to straighten the River Tees.
- ⊗ Habitats can be destroyed when making the channel.

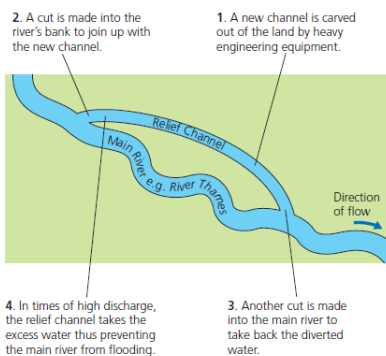
### EMBANKMENTS



An embankment is when the river bank is raised so that more water can fit into the channel. This means that the river channel holds more water before flooding occurs. This reduces the flood risk.

- ⊗ Embankments may still flood. People get a false sense of security and don't prepare for the flood.
- ⊗ Embankments have high maintenance costs and need repairing a lot!
- ⊗ They sometimes put concrete in to line the channel and this can cause animals to lose their habitats!
- ⊙ Can be used as a riverside footpath for people
- ⊙ Cheaper than other HE methods
- ⊙ Can provide habitats for water voles.

### FLOOD RELIEF CHANNELS



A flood relief channel is an artificially made channel that is designed to back up the main river channel for a river that often floods. It does this so that urban areas do not flood. During times of high discharge (lots of water in the river), gates open to allow the excess water to go into the flood relief

- ⊙ Footpaths and cycle tracks can be built along the new channel. This means people can bird watch.
- ⊙ A relief channel protects 3000 properties in Exeter
- ⊙ Some relief channels have artificial reed beds in them which give animals a habitat.
- ⊗ However, some relief channels can destroy animal's habitats.



	channel) to stop flooding.	☹️ People who used to live where the relief channel is built in Exeter have to move. ☹️ Settlements downstream of the relief channel can be flooded.
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**SOFT ENGINEERING:**

STRATEGY	HOW IT WORKS	☺️ and ☹️
<p>Floodplain Zoning</p>	<p>Where the land is used to minimise the risk of flooding. The Environment Agency categorises land into four risk-zones. The most important buildings are built in zone 1 and the least important buildings are built in zone 3b.</p>	<p>☺️ and ☹️</p> <p>☹️ In some cities, building has already taken place on the floodplain. ☹️ There is a housing shortage in the UK so a restriction on building houses is not helpful ☹️ Habitats are destroyed due to building on other greenfield sites. ☺️ Cheap ☺️ Provides green space ☺️ Less flooding due to not building on floodplain</p>
<p>Flood warnings and preparation</p>	<p>The Environmental Agency have an action plan for areas that are at risk. The MET office analyses data from its weather stations and gives flood warnings. These warnings are publicised via the media so people can prepare for a flood.</p>	<p>☺️ It is a cheap way of protecting people and their property. ☺️ If people are warned then they can keep their valuables safe. ☺️ It is a way of ensuring people's safety without having to invest in high cost hard engineering. ☹️ It may not help people who live in areas that are prone to flood. It does not stop a flood so insurance costs will be high. ☹️ Flood warnings are only effective if people listen to them and take notice of them. ☹️ Not everyone has access to social media.</p>
<p>Planting trees (afforestation)</p>	<p>Planting trees on slopes helps intercept the</p>	<p>☺️ More CO2 is absorbed.</p>

**PLANT  
MORE  
TREES!**

rainfall to reduce the flood risk. The trees take up water via their roots.

- ☺ The trees leaves can reduce surface runoff.
- ☺ Animals gain new habitats
- ☹ Animals could lose grazing land.
- ☹ Planting more trees changes the appearance of a landscape e.g. less open grass and it could look unnatural.
- ☹ Not 100% effective

River restoration



This is when the river that has previously been hard engineered is restored in an environmentally friendly way back to being a river channel. For example, trees are planted and storage areas are made.

- ☺ Creates new wetland habitats
- ☺ Looks nice
- ☺ Increase water storage reduces floods downstream.
- ☹ Expensive - Up to £11 billion.
- ☹ Lose crops
- ☹ Not 100% effective

## **An example of a flood management scheme in the UK = Jubilee River Restoration (Windsor)**

### **Location and Background**

The River Jubilee is located in south-east England. It is a relief channel (an artificial channel which takes water when the river is near full discharge) for the River Thames and is was created to take overflow water from the River Thames. It opened in 2002 and is 1.7km long and 50m wide. It cost £110 million

### **Why does the area need protecting?**

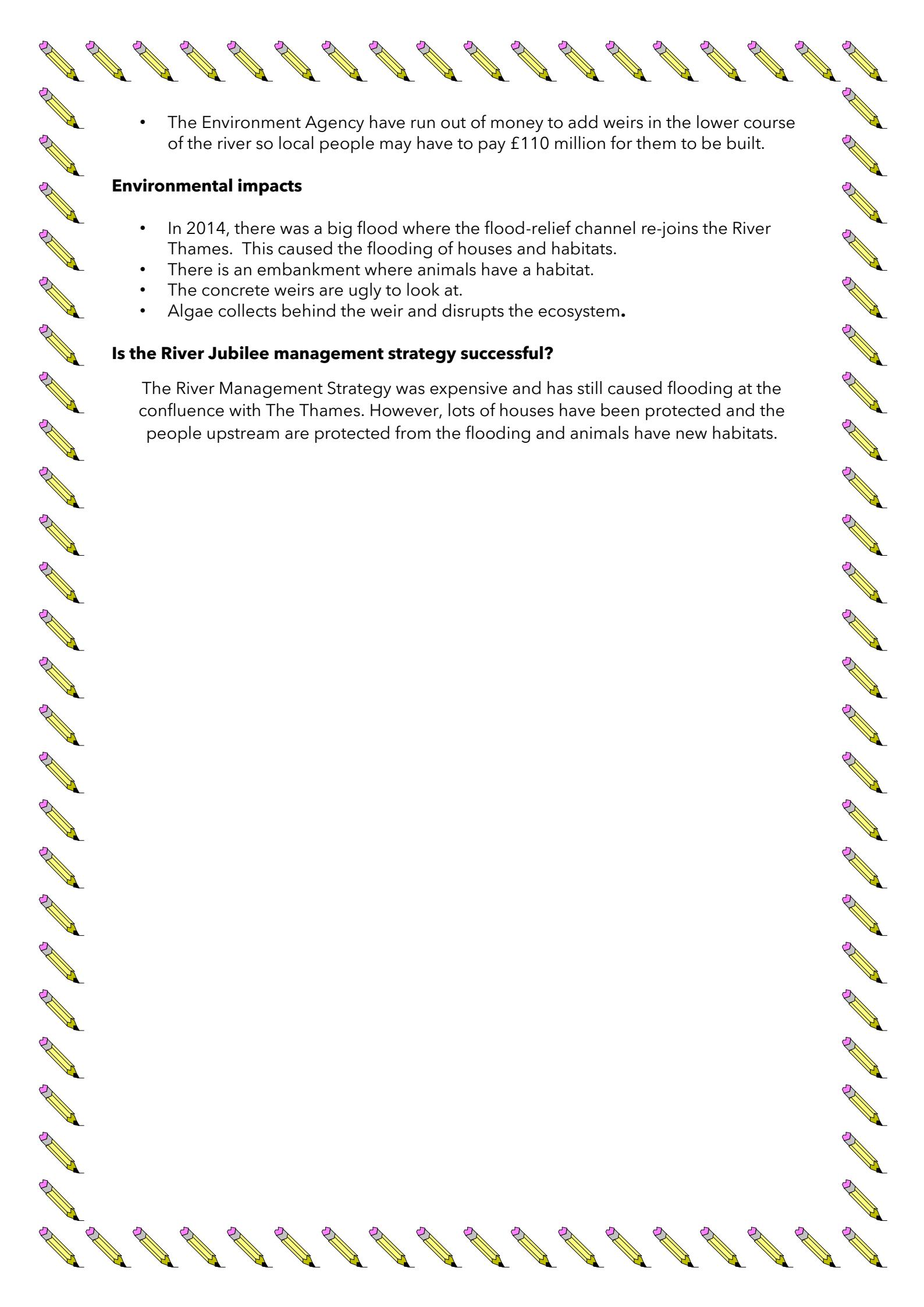
The River Jubilee is in the area of the Thames floodplain so it is very low lying and prone to flooding. The river flows by Windsor Castle and the homes around the area are very expensive e.g. Eton. The area around the river is impermeable ground so there is a lot of flooding.

### **Social impacts**

- Three thousand properties were protected in very rich Eton and Windsor.
- Other places downstream, such as Old Windsor got flooded.
- Paddle boaters were promised a river to go on. However, due to two weirs (big gates) they have to carry their boats around them.

### **Economic impacts**

- It was the most expensive flood relief scheme in the UK (£110 million)
- It has been cost effective for people who live upstream.
- The weirs were damaged by floods one year after it had been completed and had to be repaired costing £680,000.

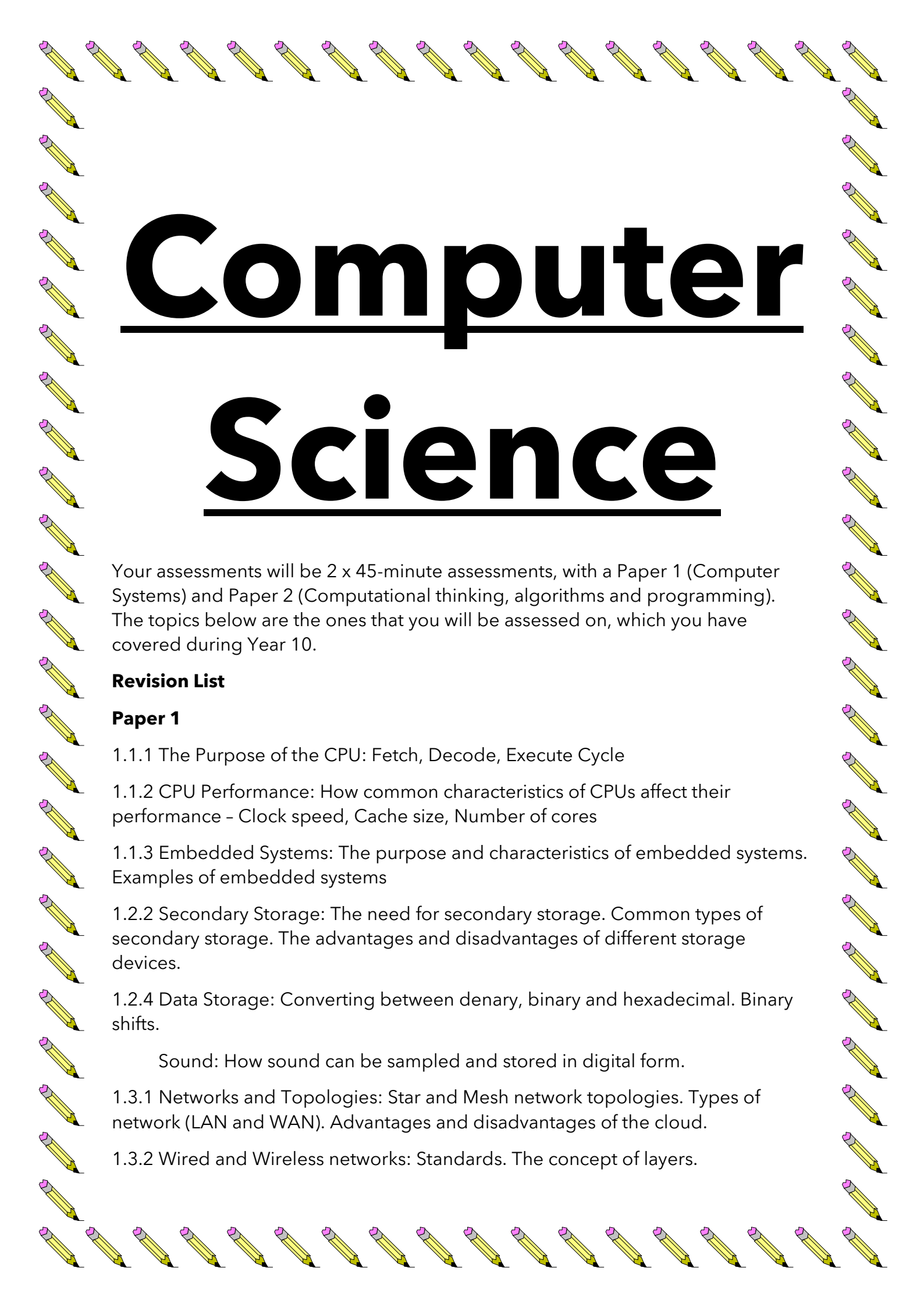
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- The Environment Agency have run out of money to add weirs in the lower course of the river so local people may have to pay £110 million for them to be built.

### **Environmental impacts**

- In 2014, there was a big flood where the flood-relief channel re-joins the River Thames. This caused the flooding of houses and habitats.
- There is an embankment where animals have a habitat.
- The concrete weirs are ugly to look at.
- Algae collects behind the weir and disrupts the ecosystem.

### **Is the River Jubilee management strategy successful?**

The River Management Strategy was expensive and has still caused flooding at the confluence with The Thames. However, lots of houses have been protected and the people upstream are protected from the flooding and animals have new habitats.



# Computer

# Science

Your assessments will be 2 x 45-minute assessments, with a Paper 1 (Computer Systems) and Paper 2 (Computational thinking, algorithms and programming). The topics below are the ones that you will be assessed on, which you have covered during Year 10.

## **Revision List**

### **Paper 1**

1.1.1 The Purpose of the CPU: Fetch, Decode, Execute Cycle

1.1.2 CPU Performance: How common characteristics of CPUs affect their performance - Clock speed, Cache size, Number of cores

1.1.3 Embedded Systems: The purpose and characteristics of embedded systems. Examples of embedded systems

1.2.2 Secondary Storage: The need for secondary storage. Common types of secondary storage. The advantages and disadvantages of different storage devices.

1.2.4 Data Storage: Converting between denary, binary and hexadecimal. Binary shifts.

Sound: How sound can be sampled and stored in digital form.

1.3.1 Networks and Topologies: Star and Mesh network topologies. Types of network (LAN and WAN). Advantages and disadvantages of the cloud.

1.3.2 Wired and Wireless networks: Standards. The concept of layers.



## Paper 2

2.1.2 Designing, creating and refining algorithms. Trace tables. Structure diagrams. Create, interpret, correct, complete and refine algorithms using pseudocode and flowcharts.

2.1.3 Searching and Sorting algorithms. Bubble sort, merge sort, insertion sort, binary search, linear search.

2.2.1 Programming fundamentals. The use of variables and constants. Sequence, selection and iteration.

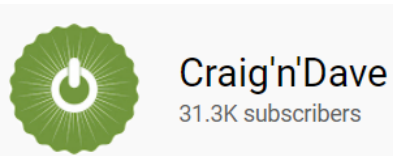
2.2.2 Data Types

2.2.3 Advanced programming techniques: The use of string manipulation.

Please use the following resources to help you prepare:

- 1) Craig N Dave Videos
- 2) Smart Revise
- 3) Seneca Learning
- 4) CGP Revision guide
- 5) GCSEPOD
- 6) Your areas of development from the previous mock assessment
- 7) Practise exam papers (to be given out shortly)

### **Craig N Dave Videos**



There are videos available for each individual part of the course. A link to these is below:

<https://www.youtube.com/watch?v=7Up7DIPkTzo&list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF>

I would suggest identifying topics that you are not confident on. Watch the video and make notes, flash cards, mind maps or diagrams

### **Smart Revise**





<https://www.smartrevise.online/>

We have filtered this so that only examinable content is on here

There are three functions

- 1) Smart Quiz - Multiple choice quizzes. When you get an answer incorrect, please read the advice and watch the video if you need to. It may be a good idea to write the advice down in a book or even copy it to a word document.
- 2) Smart Terms - Online flashcards that can be used for revisions, handy for learning definitions
- 3) Smart Advance - The best feature. Hundreds of past paper questions for you to attempt. Mark schemes included via a tick box so you can see whether you have gained the marks and also where marks can be gained from.

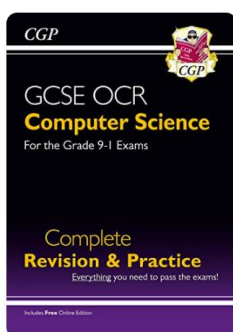
### **Seneca Learning**



<https://senecalearning.com/en-GB/>

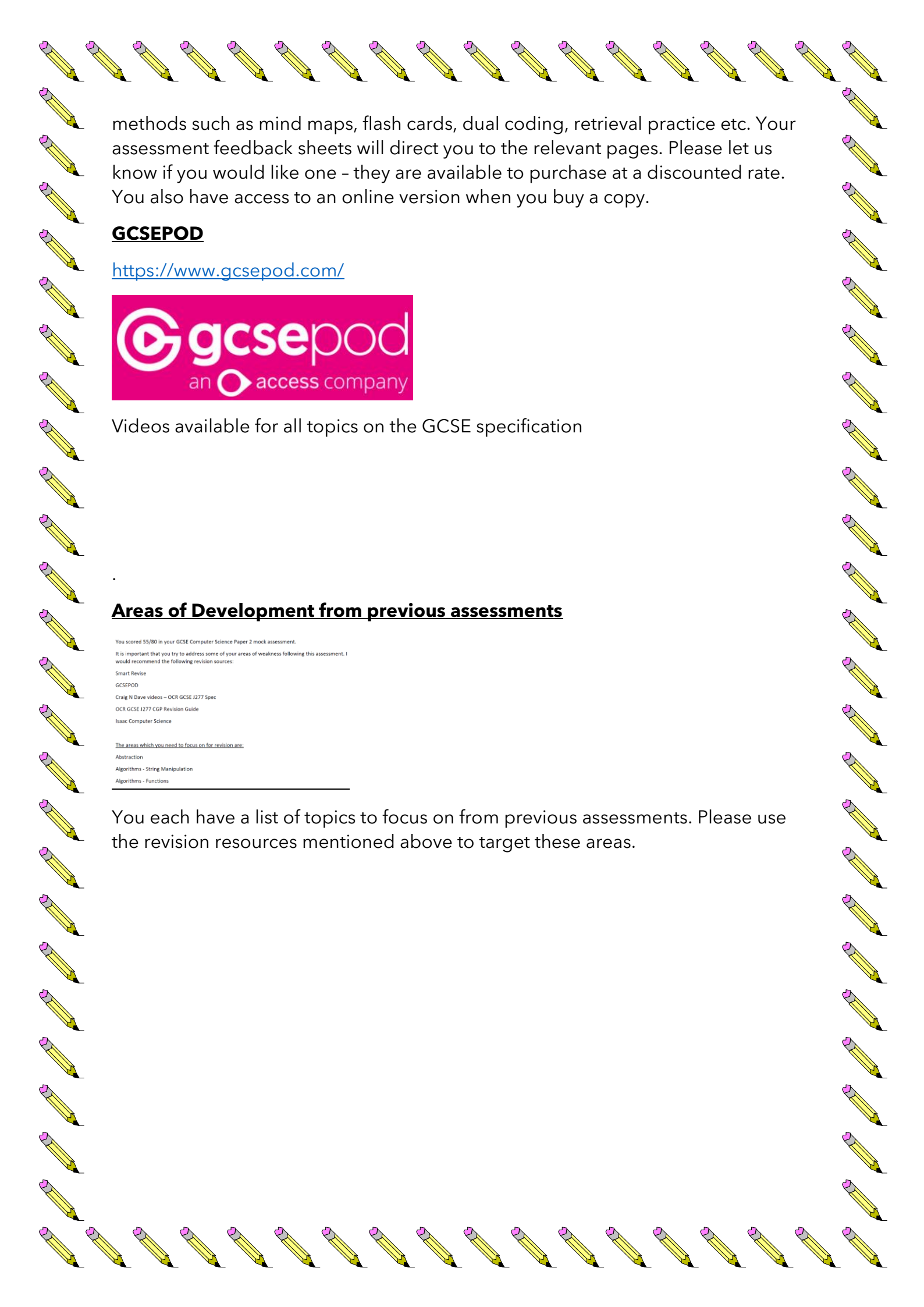
This is an interactive guide you can use to read about topics and to practise questions.

### **CGP Revision Guide**



These are fantastic! Complete revision notes for all topics, as well as accompanying exam practise questions. Additionally, there are past papers in the back of these, with solutions. These can be used with a variety of other revision





methods such as mind maps, flash cards, dual coding, retrieval practice etc. Your assessment feedback sheets will direct you to the relevant pages. Please let us know if you would like one - they are available to purchase at a discounted rate. You also have access to an online version when you buy a copy.

## **GCSEPOD**

<https://www.gcsepod.com/>



Videos available for all topics on the GCSE specification

## **Areas of Development from previous assessments**

You scored 55/80 in your GCSE Computer Science Paper 2 mock assessment.  
It is important that you try to address some of your areas of weakness following this assessment. I would recommend the following revision sources:

- Smart Revise
- GCSEPOD
- Craig N Dave videos – OCR GCSE J277 Spec
- OCR GCSE J277 CGP Revision Guide
- Isaac Computer Science

The areas which you need to focus on for revision are:

Abstraction  
Algorithms - String Manipulation  
Algorithms - Functions

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You each have a list of topics to focus on from previous assessments. Please use the revision resources mentioned above to target these areas.



# Citizenship

Section 2: Democracy and Government

[2.1] Democracy, Elections and Voting in the UK  
(OCR Book Reference Chapter 4)



EXAM BOARD CONTENT	LEARN TOPIC	REVIEWED TOPIC	REVISED TOPIC	Confidence Level		
				Developing (RED)	Secure (AMBER)	Extended (GREEN)
I can explain the evolution of democracy and the different types (Direct and Representative.)						
I understand the features of a democratic government in the UK (inclusive franchise.)						
I can explain citizens roles and responsibilities in an election (how to vote, be a candidate, join a party.)						
I can name the main UK political parties, their leaders and some issues they stand for.						
I can name the main political parties of Scotland, Wales and Northern Ireland (Unionist and Nationalists.)						
I understand and can explain how the 'First Past the Post' electoral system works (Compare it to PR.)						
I understand the different types of electoral systems and which election they are used in.						
I can explain the advantages and disadvantages of each electoral system (FPTP, AMS, STV, Closed Party list system.)						
I understand how a general election works and can explain the outcome of the most recent elections.						
I can define the key terms: Constituency, Referendum, Manifesto, By-election and Ballot.						
I know who can and cannot vote in different elections across the UK.						
I understand how citizens can hold those in power to account.						

**Key terminology and understanding for this chapter:**

Franchise, Suffrage, Elections, Ballot, Policy, Political Party, Manifesto, Polling Station, Classical Democracy, Direct Democracy, Representative Democracy, Parliament, Constituency, Electoral Systems, Accountability, Scrutiny, Referendum, Turnout, Polling, Mandate.