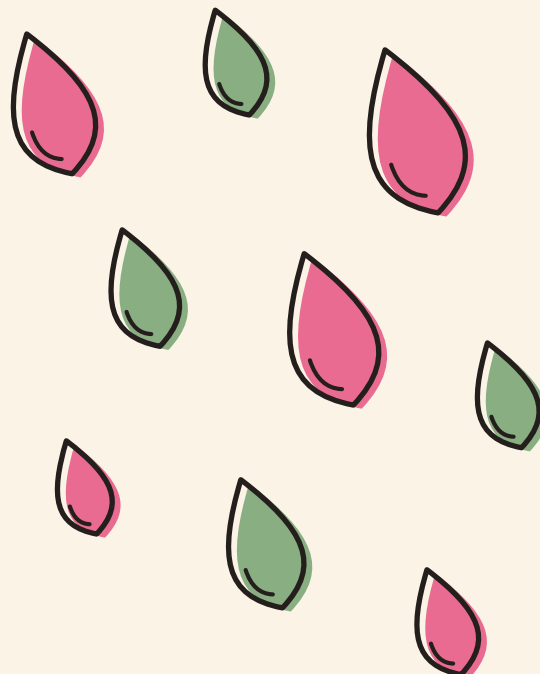


Rainy Day *Biology*



ACTIVITY PACK

Print, cut and play

One of every game in the series, taken from all three books. Each comes with instructions and a teacher key.

Dominoes	Eukaryotes & prokaryotes	IB A2.2 • B2.2 • AP Unit 2
Triangle Jigsaw	Cell respiration (HL)	IB C1.2 • AP Unit 3
Triominoes	Stages of mitosis	IB D2.1 • AP Unit 4
Diamonds	Arteries vs veins	IB B3.2 • AP Unit 8
Bingo	Ecology	IB C4.1 • AP Unit 8
Last One Standing	Biological molecules	IB B1.1 • B1.2 • A1.2 • AP Unit 1
Banned Words	Diversity of organisms	IB A3.1 • AP Unit 7
Double Agents	Ecology	IB C4.1 • C4.2 • AP Unit 8

Eukaryotes & prokaryotes

How to play. Deal every domino out. Whoever holds the start card reads its question; whoever holds the matching answer reads it out, then reads their own question. Keep going until the chain comes back to the start card.

A  80S ribosomes	Q Which organelle holds the cell's chromosomes and controls gene expression?
A  Binary fission	Q Which organelle is the site of photosynthesis in plant cells?
A  Golgi apparatus	Q What is the large storage sac in plant cells that maintains turgor pressure?
A  Rough ER	Q A small membrane sac that is used for transport within the cell?
A Vacuole	Q A region in a prokaryote that contains the circular DNA?
A  Phospholipid	Q What term describes a molecule with both a hydrophilic and a hydrophobic part?
A Naked and circular	Q Which region inside the nucleus makes rRNA?
A  Chloroplast	Q What network of protein filaments provides transport tracks?
A  Mitochondrion	Q Which membrane-bound sac holds hydrolytic enzymes to digest waste and worn-out organelles?
A Nuclear pore	Q Which organelle is studded with 80S ribosomes and makes proteins for secretion?
A  Cytoskeleton	Q Where are the proteins synthesised by free ribosomes used?
A 70S ribosome	Q Lipid that makes up the cell membrane?

Eukaryotes & prokaryotes

Cut along the dashed lines. Every answer (A) matches a question (Q) on another domino.

A Fluid mosaic model	Q What lipid is found in animal cell membranes that regulates fluidity?
A Nucleus 	Q What describes the genetic material of a eukaryotic nucleus?
A Linear and bound to histone proteins	Q What is the size of ribosomes found in prokaryotes?
A Vesicle 	Q Which organelle detoxifies drugs and synthesizes lipids?
A Cell wall 	Q Prokaryotic DNA is...
A Nucleolus 	Q A hole in the nuclear membrane where mRNA exits?
A Cholesterol 	Q What is the simple method of cell division in prokaryotes?
A Amphipathic	Q What organelle has 70S ribosomes and is the site of aerobic respiration?
A Nucleoid	Q Which cell type has no membrane-bound organelles, so no compartmentalisation?
A Cytosol 	Q Site of protein synthesis in the eukaryotic cytoplasm?
A Prokaryote 	Q What model describes the plasma membrane as a lipid sea with floating proteins?
A Inside the cell	Q Engulfing material to form a vesicle inside the cell?

Eukaryotes & prokaryotes

Cut along the dashed lines. Every answer (A) matches a question (Q) on another domino.

A  Endocytosis	Q Liquid component of the cytoplasm?
A  Plasmid	Q Which rigid outer layer is made of chitin in fungi and also surrounds plant cells and most prokaryotes?
A  Smooth ER	Q Which organelle modifies, sorts, and packages proteins for transport via vesicle?
A  Lysosome	Q A small loop of DNA in prokaryotes? START

Teacher key: Eukaryotes & prokaryotes

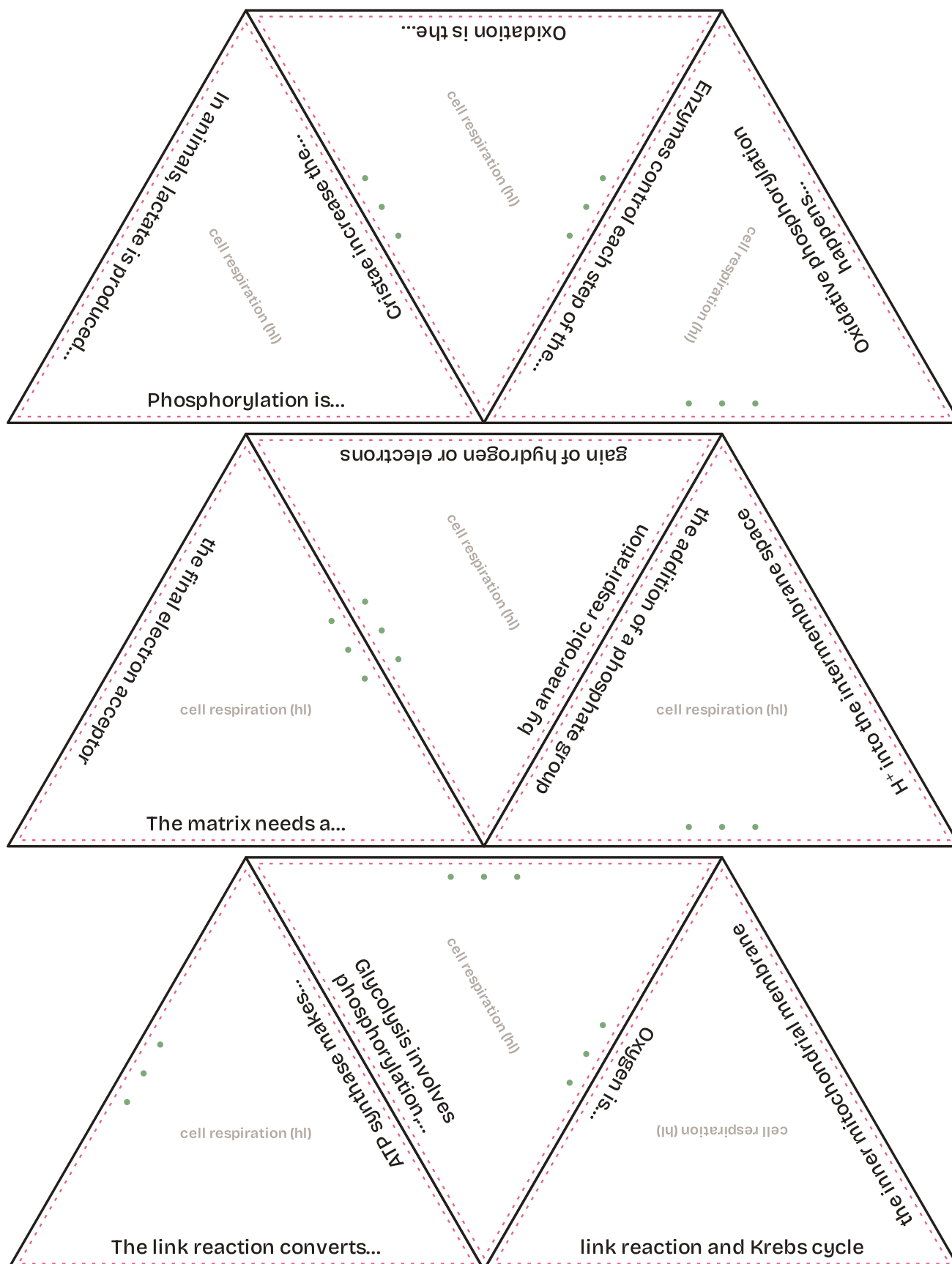
IB A2.2 · B2.2

AP Unit 2

#	QUESTION READ OUT	ANSWER THAT FOLLOWS
1	A small loop of DNA in prokaryotes?	Plasmid
2	Which rigid outer layer is made of chitin in fungi and also surrounds plant cells and most prokaryotes?	Cell wall
3	Prokaryotic DNA is...	Naked and circular
4	Which region inside the nucleus makes rRNA?	Nucleolus
5	A hole in the nuclear membrane where mRNA exits?	Nuclear pore
6	Which organelle is studded with 80S ribosomes and makes proteins for secretion?	Rough ER
7	A small membrane sac that is used for transport within the cell?	Vesicle
8	Which organelle detoxifies drugs and synthesizes lipids?	Smooth ER
9	Which organelle modifies, sorts, and packages proteins for transport via vesicle?	Golgi apparatus
10	What is the large storage sac in plant cells that maintains turgor pressure?	Vacuole
11	A region in a prokaryote that contains the circular DNA?	Nucleoid
12	Which cell type has no membrane-bound organelles, so no compartmentalisation?	Prokaryote
13	What model describes the plasma membrane as a lipid sea with floating proteins?	Fluid mosaic model
14	What lipid is found in animal cell membranes that regulates fluidity?	Cholesterol
15	What is the simple method of cell division in prokaryotes?	Binary fission
16	Which organelle is the site of photosynthesis in plant cells?	Chloroplast
17	What network of protein filaments provides transport tracks?	Cytoskeleton
18	Where are the proteins synthesised by free ribosomes used?	Inside the cell
19	Engulfing material to form a vesicle inside the cell?	Endocytosis
20	Liquid component of the cytoplasm?	Cytosol
21	Site of protein synthesis in the eukaryotic cytoplasm?	80S ribosomes
22	Which organelle holds the cell's chromosomes and controls gene expression?	Nucleus
23	What describes the genetic material of a eukaryotic nucleus?	Linear and bound to histone proteins
24	What is the size of ribosomes found in prokaryotes?	70S ribosome
25	Lipid that makes up the cell membrane?	Phospholipid
26	What term describes a molecule with both a hydrophilic and a hydrophobic part?	Amphipathic
27	What organelle has 70S ribosomes and is the site of aerobic respiration?	Mitochondrion
28	Which membrane-bound sac holds hydrolytic enzymes to digest waste and worn-out organelles?	Lysosome

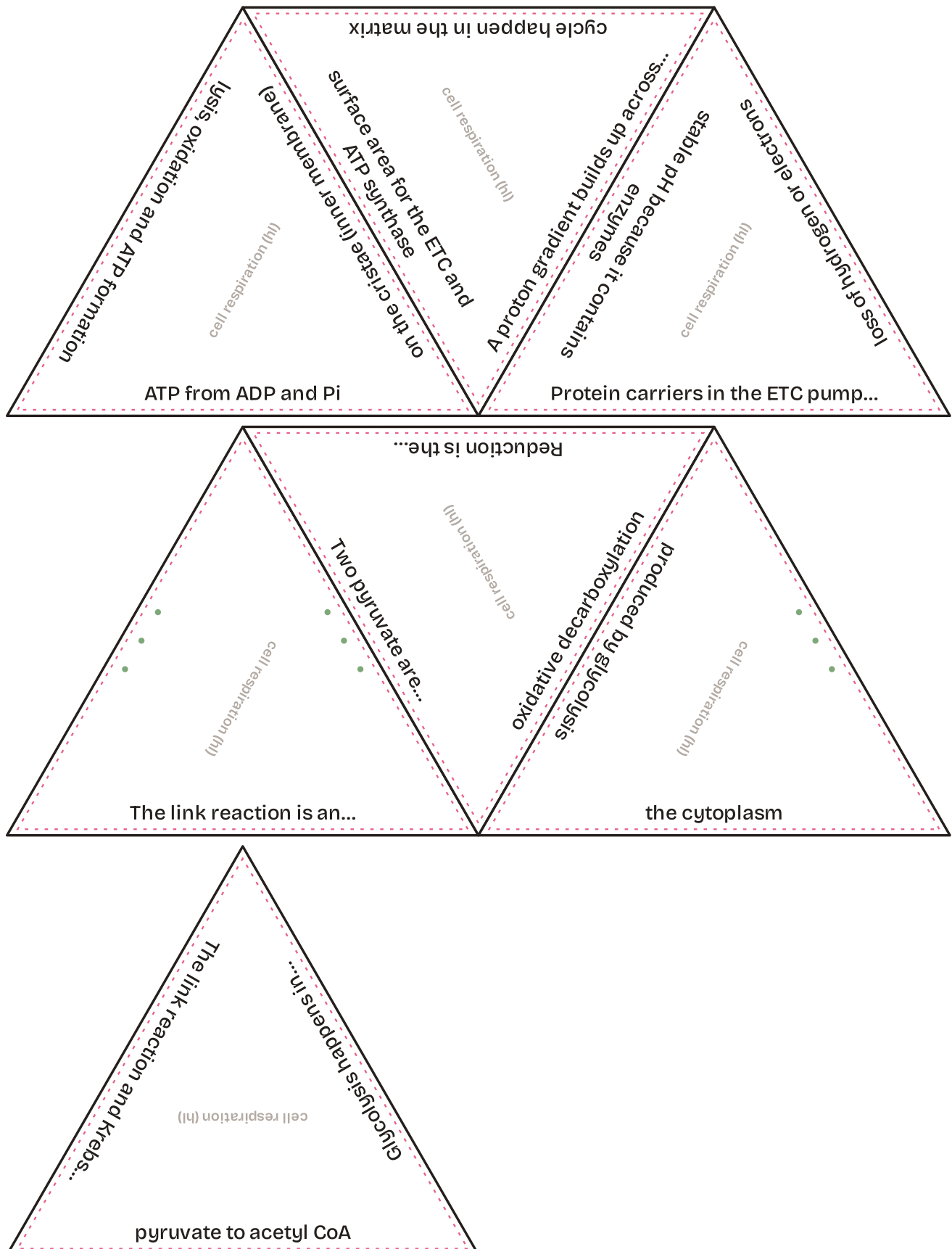
Cell respiration (HL)

How to play. Cut out all 16 triangles. Match every edge to its partner to rebuild one big triangle. Edges marked with green dots belong on the outside.

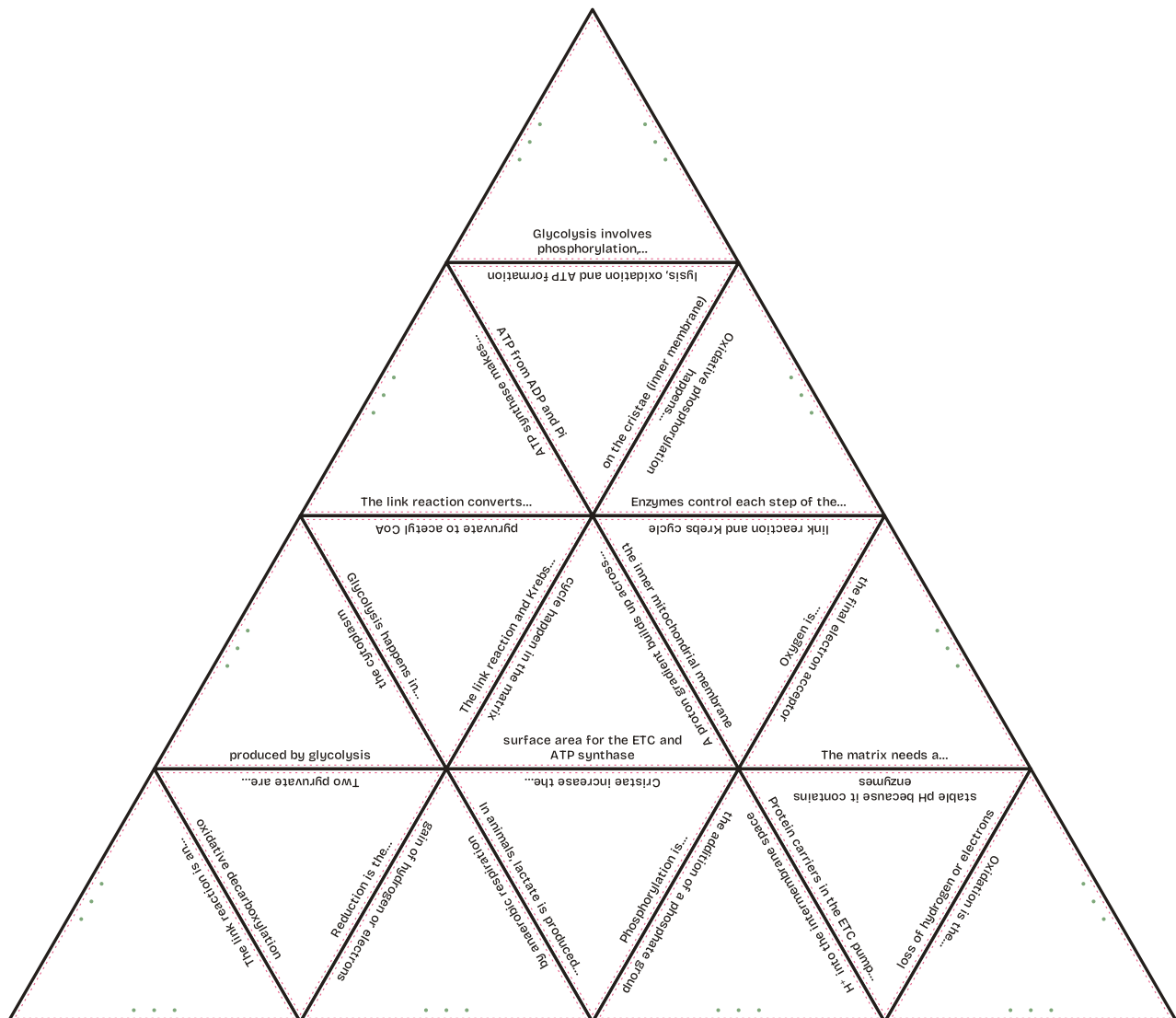


Cell respiration (HL)

Keep cutting: these pieces belong to the same puzzle.



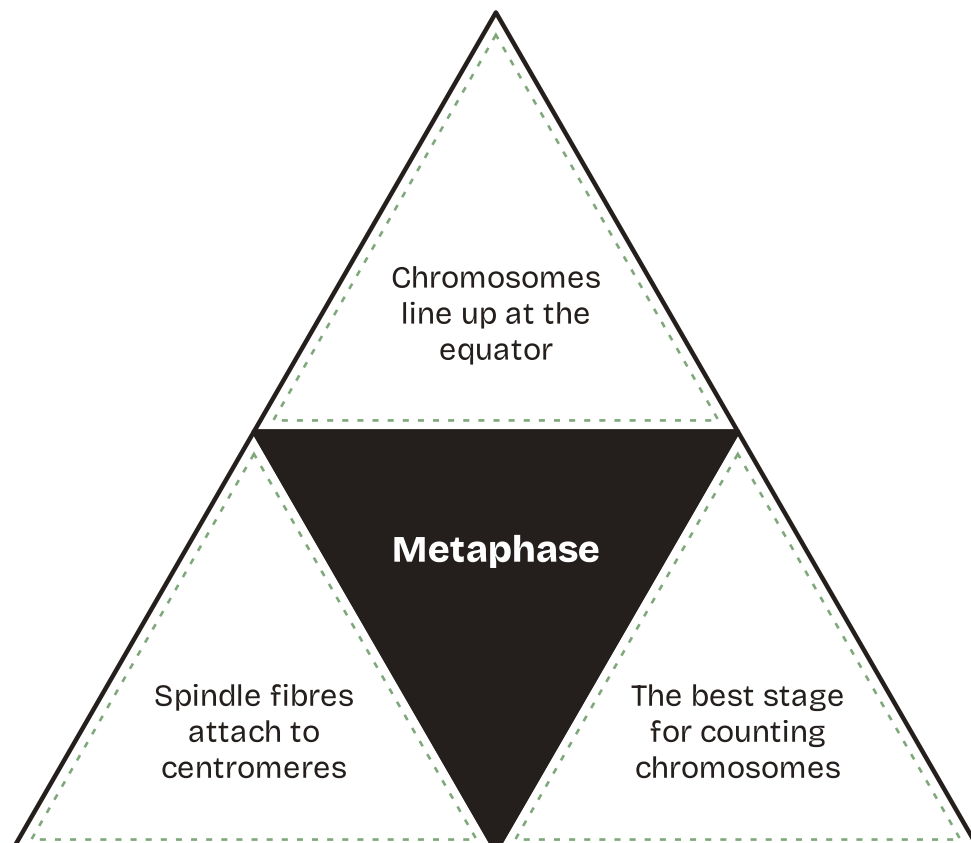
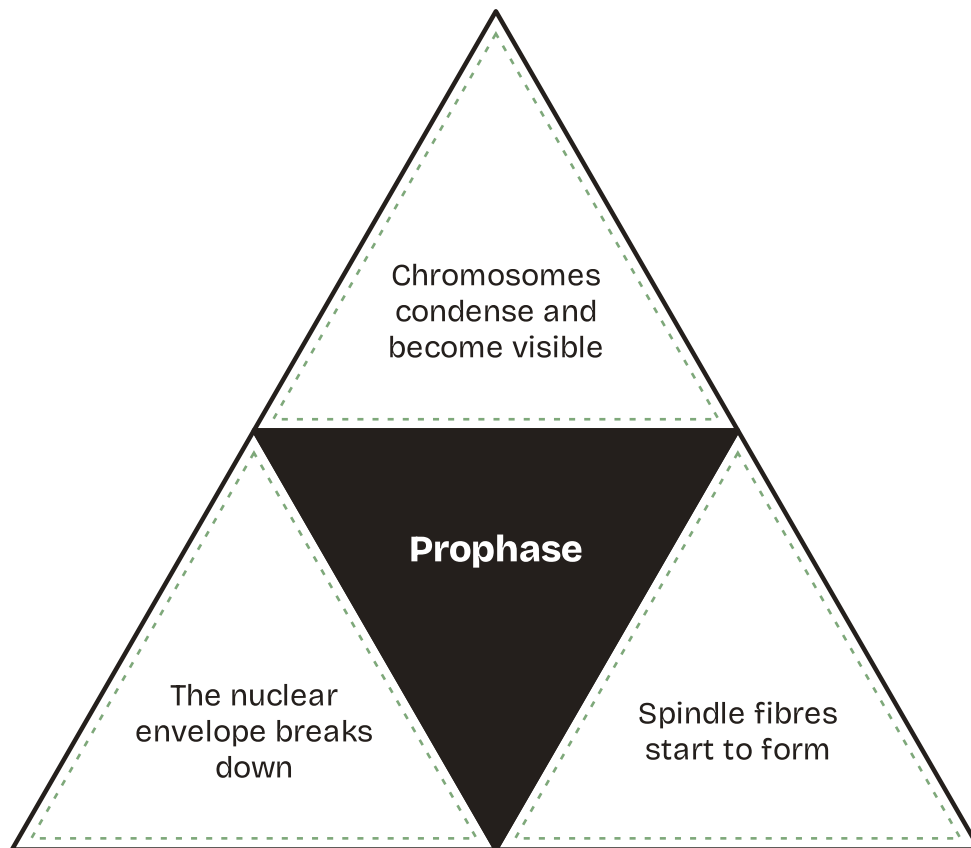
Teacher key: Cell respiration (HL)



Protein carriers in the ETC pump...	H⁺ into the intermembrane space	The matrix needs a...	stable pH because it contains enzymes
Reduction is the...	gain of hydrogen or electrons	Enzymes control each step of the...	link reaction and Krebs cycle
Oxidation is the...	loss of hydrogen or electrons	The link reaction converts...	pyruvate to acetyl CoA
Oxygen is...	the final electron acceptor	In animals, lactate is produced...	by anaerobic respiration
Oxidative phosphorylation happens...	on the cristae (inner membrane)	Cristae increase the...	surface area for the ETC and ATP synthase
Phosphorylation is...	the addition of a phosphate group	The link reaction is an...	oxidative decarboxylation
Two pyruvate are...	produced by glycolysis	ATP synthase makes...	ATP from ADP and Pi
Glycolysis happens in...	the cytoplasm	A proton gradient builds up across...	the inner mitochondrial membrane
The link reaction and Krebs...	cycle happen in the matrix	Glycolysis involves phosphorylation...	lysis, oxidation and ATP formation

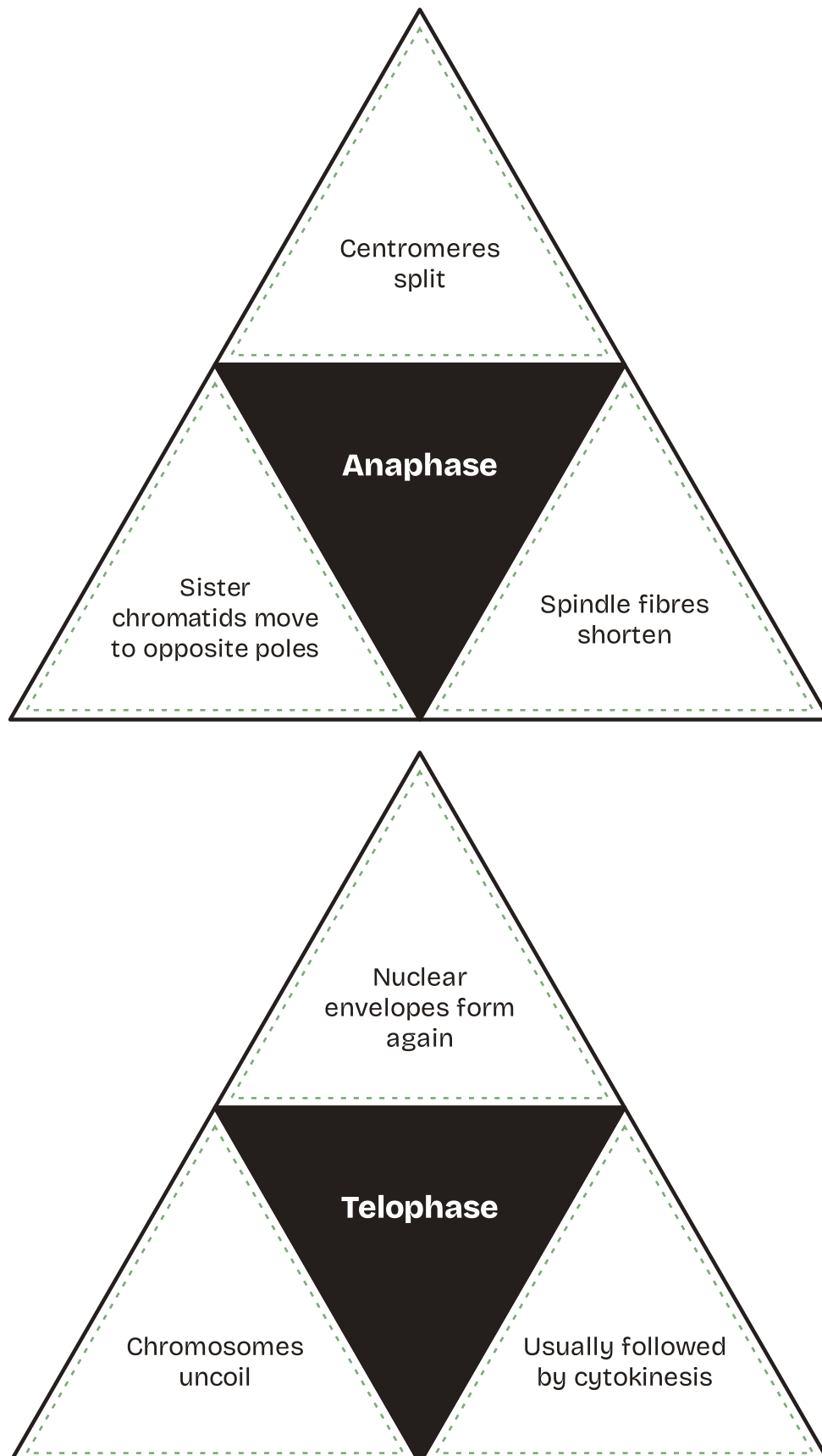
Stages of mitosis

How to play. Copy onto card and cut along every solid line. Mix all the triangles, then rebuild each set: three white triangles fit around each dark centre. Keep one uncut copy as your answer key.



Stages of mitosis

Cut along every solid line and add these to the mix.



Arteries vs veins

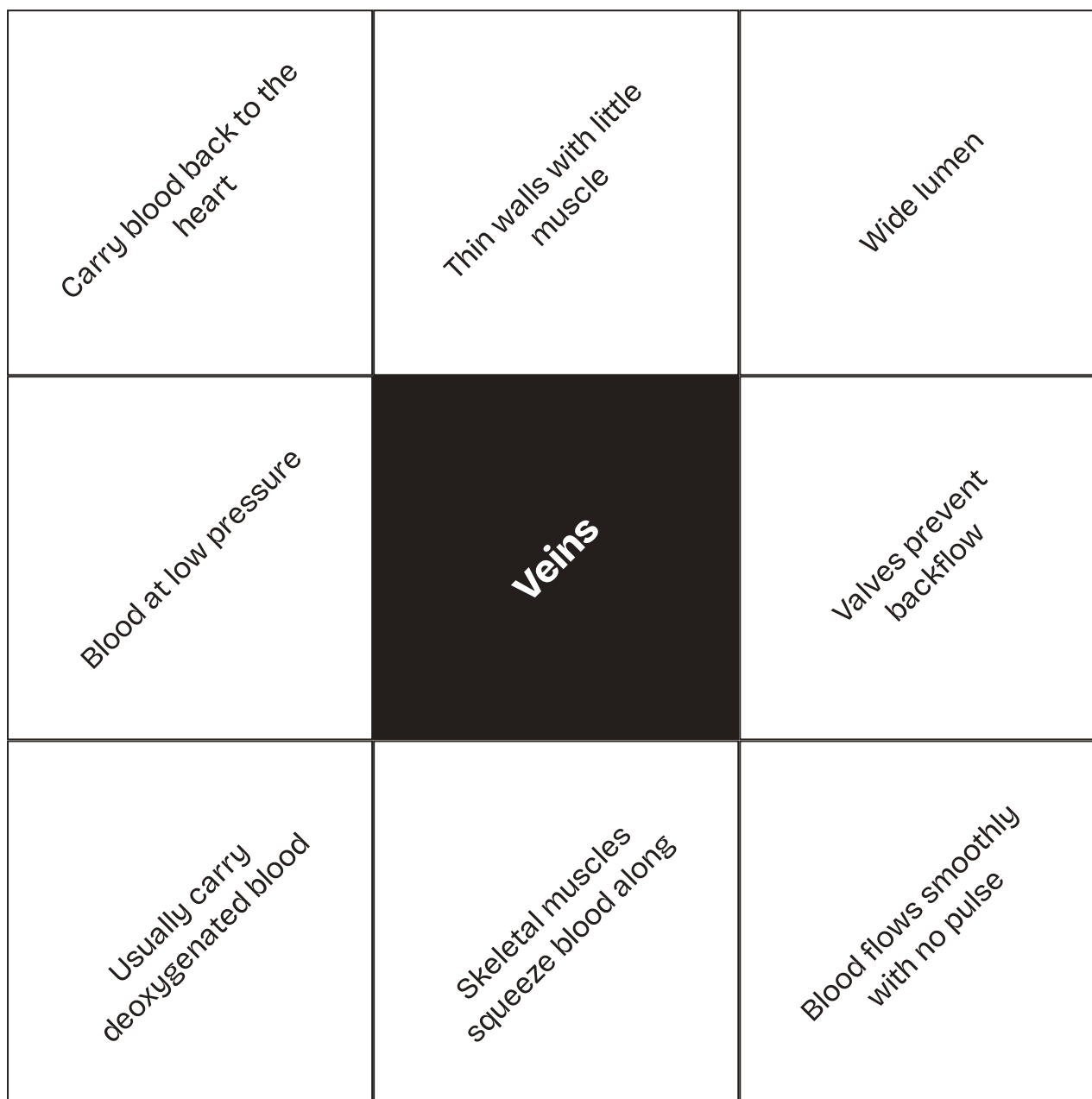
How to play. Copy every grid onto card and cut along the thick lines. Mix all 18 cards together. In pairs, rebuild each diamond: eight cards that are true for each dark centre card.

Carry blood away from the heart	Thick muscular walls	Lots of elastic fibres
Narrow lumen	Arteries	Blood at high pressure
You can feel a pulse	Usually carry oxygenated blood	No valves along their length

Tip: read each card aloud before placing it. Some cards look similar, so argue your case!

Arteries vs veins

Cut along the thick lines and add these cards to the mix.



Tip: read each card aloud before placing it. Some cards look similar, so argue your case!

Ecology

IB C4.1

AP Unit 8

How to play. Each player picks any 9 terms from the bank and writes one in each square. The caller reads clues in a random order; cross off a term when you think its clue has been read. Shout BINGO for a full card, then read your terms back to be checked.

B I N G O Ecology

Name: _____

Population Community Carrying capacity Ecological niche Mutualism Parasitism
 Predation Herbivory Interspecific competition Commensalism Invasive species
 Top-down control Bottom-up control Exponential phase Plateau phase Limiting factor

B I N G O Ecology

Name: _____

Population Community Carrying capacity Ecological niche Mutualism Parasitism
 Predation Herbivory Interspecific competition Commensalism Invasive species
 Top-down control Bottom-up control Exponential phase Plateau phase Limiting factor

Teacher key: Ecology

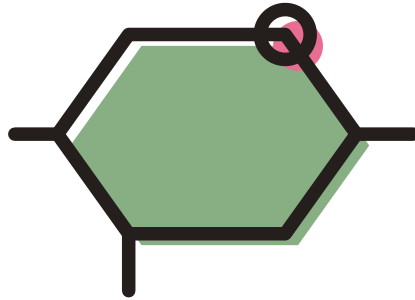
✓	READ OUT	TERM
☐	One species benefits and the other is unaffected	Commensalism
☐	Stage of population growth when numbers rise fastest	Exponential phase
☐	A relationship where both species benefit	Mutualism
☐	Stage when the population levels off at carrying capacity	Plateau phase
☐	One organism lives on or in a host and harms it	Parasitism
☐	All the interacting populations of different species in an area	Community
☐	A resource in short supply that stops a population growing	Limiting factor
☐	The largest population an environment can support long-term	Carrying capacity
☐	Different species competing for the same limited resource	Interspecific competition
☐	One consumer kills and eats another	Predation
☐	A primary consumer feeding on a producer	Herbivory
☐	A population limited by predators or herbivores	Top-down control
☐	A species' role and use of resources in its ecosystem	Ecological niche
☐	A non-native species that outcompetes native species	Invasive species
☐	A population limited by nutrients or energy at the base of the chain	Bottom-up control
☐	Organisms of one species living in the same area at the same time	Population

Biological molecules

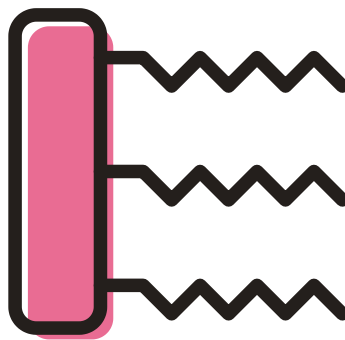
IB B1.1 • B1.2 • A1.2

AP Unit 1

How to play. Every student gets one full set of cards. Everyone stands. The teacher reads a clue; hold up the card that matches, fast. Wrong card (or too slow) and you sit down. Last one standing wins.

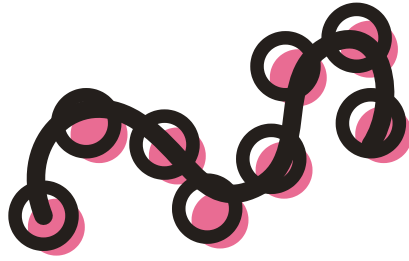


Carbohydrates



Lipids

Cut along the dashed line.



Proteins



Nucleic acids

Teacher key: Biological molecules

#	READ OUT	CARD TO HOLD UP
1	Made of monosaccharides joined by glycosidic bonds	Carbohydrates
2	One glycerol joined to three fatty acids	Lipids
3	Monomers joined by peptide bonds	Proteins
4	Monomers are nucleotides	Nucleic acids
5	Glycogen, stored in the liver	Carbohydrates
6	Joined by ester bonds	Lipids
7	Enzymes and antibodies	Proteins
8	Has a sugar-phosphate backbone	Nucleic acids
9	Cellulose in plant cell walls	Carbohydrates
10	Can be saturated or unsaturated	Lipids
11	Shape held by hydrogen bonds, ionic bonds and disulfide bridges	Proteins
12	Contains the bases A, T, C and G (or U)	Nucleic acids
13	Sucrose and lactose	Carbohydrates
14	Phospholipids and steroids	Lipids
15	The R group gives each monomer its properties	Proteins
16	Carries the genetic code	Nucleic acids
17	Starch, made of amylose and amylopectin	Carbohydrates
18	Cholesterol	Lipids
19	Haemoglobin and collagen	Proteins
20	mRNA and tRNA	Nucleic acids
21	Formed by condensing glucose molecules together	Carbohydrates
22	Insoluble energy store in adipose tissue	Lipids
23	Denatured by high temperature or extreme pH	Proteins
24	Every monomer contains phosphorus	Nucleic acids

Diversity of organisms

IB A3.1

AP Unit 7

How to play. Two teams. One player draws a card and describes the word in pink for their team, without saying any of the banned words (or bits of them). One minute per turn. A point for every word guessed; the other team buzzes if a banned word slips out.

DESCRIBE

Genome

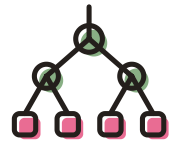


WITHOUT SAYING...

Gene
DNA
Chromosome

DESCRIBE

Dichotomous key

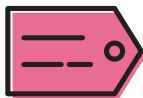


WITHOUT SAYING...

Morphological
Characteristics
Species

DESCRIBE

Binomial nomenclature



WITHOUT SAYING...

Genus
Species
Classification

DESCRIBE

Biological species concept



WITHOUT SAYING...

Interbreed
Fertile
Hybrid

DESCRIBE

Morphological species concept



WITHOUT SAYING...

Structure
Appearance
Comparison

DESCRIBE

Chromosomes



WITHOUT SAYING...

DNA
Genes
Organisation

Diversity of organisms

IB A3.1

AP Unit 7

Cut along the dashed lines.

DESCRIBE

Binary fission

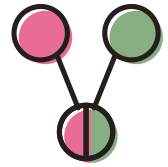


WITHOUT SAYING...

Divide
Bacteria
Two

DESCRIBE

Hybrid



WITHOUT SAYING...

Interbreed
Reproduction
Species

DESCRIBE

Variation

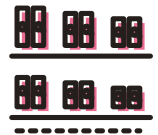


WITHOUT SAYING...

Mutations
Gene
Species

DESCRIBE

Karyotype



WITHOUT SAYING...

Chromosomes
DNA
Identify

DESCRIBE

Horizontal gene transfer (HL)



WITHOUT SAYING...

Bacteria
DNA
Plasmid

DESCRIBE

DNA barcoding (HL)



WITHOUT SAYING...

Sequence
Species
Identify

How to play. Two teams race to find their secret agents hidden among the 25 words, guided by one-word clues from their spymaster. Full rules and a worked example are on the next page.

Population	Community	Niche	Carrying capacity	Mutualism
Parasitism	Predation	Herbivory	Competition	Commensalism
Invasive species	Producer	Consumer	Decomposer	Trophic level
Food web	Biomass	Ecosystem	Habitat	Pathogen
Detritivore	Autotroph	Heterotroph	Quadrat	Keystone species

Lay the 25 cards out in a 5 × 5 grid (or use this sheet as the board and cover words with coloured counters). The upside-down word lets players on the far side of the table read it too.

You need

The 25 word cards, one spymaster key, and something to cover cards with: two colours of counters, sticky notes or paper scraps (pink, green and one plain).

Set up

1. Split into two teams, **Pink** and **Green**. Each team picks one **spymaster**.
2. Lay the 25 cards in a 5 × 5 grid.
3. The spymasters sit together and share one key card. Nobody else may see it.
4. Each square on the key matches the word in the same position. **Pink** squares are Pink's agents, **green** squares are Green's, grey squares are bystanders, and the black square is the **assassin**.
5. The strip on the key shows who starts. That team has 9 agents to find; the other team has 8.

Winning

The first team to cover all of its agents wins. A team that touches the assassin loses straight away.

Taking a turn

1. **Clue.** The spymaster says one biology word and a number, e.g. *energy* 2. The number says how many cards link to the clue.
2. **Guess.** The team talks it over, then touches one card at a time.
3. **Cover.** The spymaster covers the touched card with its true colour:
 - Your own colour: correct, you may guess again.
 - The other team's colour: your turn ends (and you've helped them).
 - Grey bystander: your turn ends.
 - Black assassin: your team loses.
4. **Stop.** You get up to the number plus one guesses, and you can stop any time.

Spymaster rules

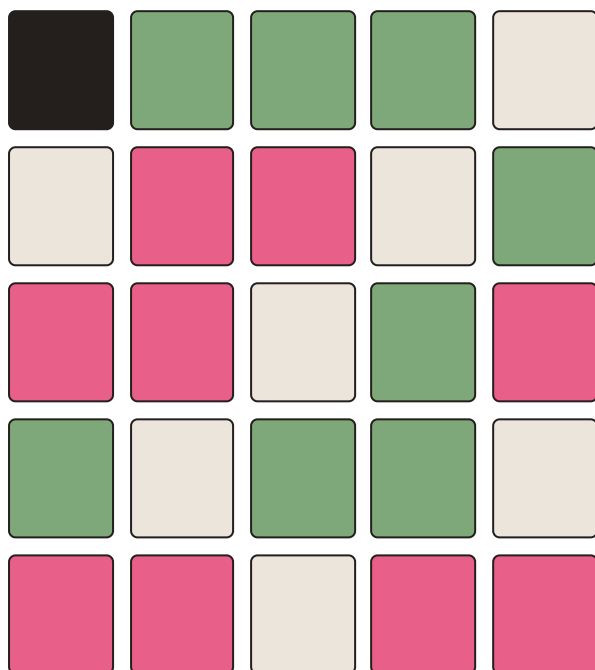
No pointing, no gestures, no hints in your voice. The clue can't be a word on the board or part of one.

Worked example. Pink's agents include Producer, Autotroph and Food web. Pink's spymaster says *Photosynthesis* 2. The team touches **Producer** (pink, correct) and **Autotroph** (pink, correct). They can take one bonus guess or stop and pass to Green.

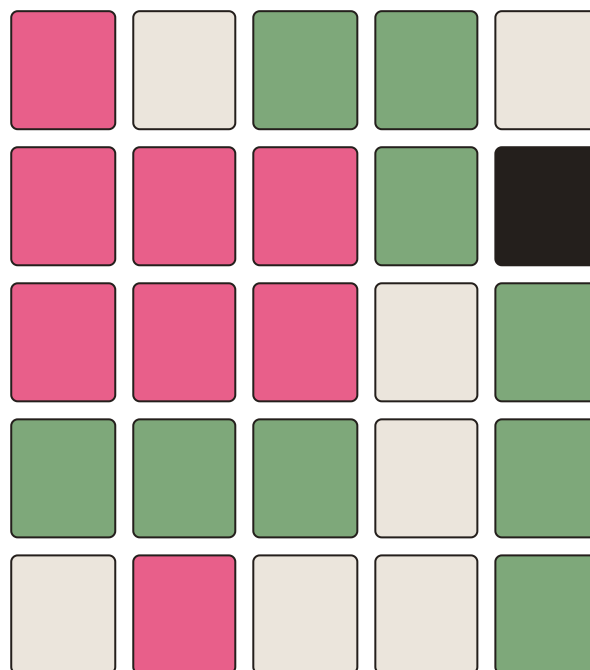
First time playing? Treat the assassin as a bystander, and set a one-minute timer for each clue to keep the game moving.

Cut out the four keys and use a different one each game. The strip shows which team starts. Grey = bystander, black = assassin.

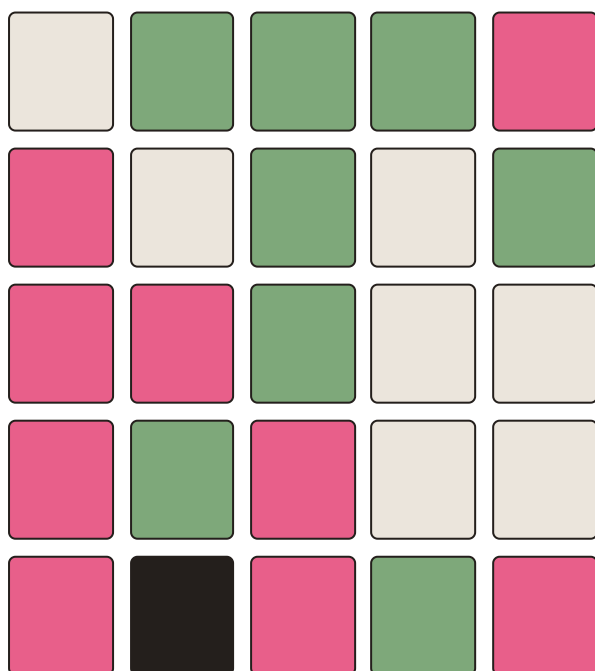
PINK STARTS



GREEN STARTS



PINK STARTS



GREEN STARTS

