

Water

Three one-hour lesson plans, and one more at higher level

Two one-hour lessons cover the standard level statements, a practical hour runs [the dry lab](#) or the bench version, and a fourth hour adds the higher level (the guide gives A1.1 two hours at SL and one more at HL). The plan follows the chapters, so a class can read the guide for homework and use the lesson for the activities. Every figure plays on a projector: step through it with the arrow keys and stop on each caption.

LESSON	COVERS	FOCUS	CHAPTERS
1 Water's charges, and what they do	A1.1.1 to A1.1.3	Water as the medium for life, its polar molecules and hydrogen bonds, and cohesion: surface tension and the pull up the xylem	1, 2, 3
2 Sticky, soluble, and a place to live	A1.1.4 to A1.1.6	Adhesion and capillary action, water as the solvent, and water against air for the loon and the ringed seal	4, 5, 6
3 Wet wicks, or water at the bench	Practical	What makes a wet surface cool: the wet wicks dry lab (or the bench stations), with repeats, mean, SD and SE	lab
4 Water from space, and life beyond Earth HL	A1.1.7, A1.1.8	Where Earth's water came from and why it stayed, and the Goldilocks zone in the search for life	7, 8

The guide, for the class to read and play: biologybybradford.com/guides/ib-biology-a1-1-water

Water's charges, and what they do

60 minutes • A1.1.1 to A1.1.3 • Chapters 1, 2, 3

Water as the medium for life, its polar molecules and hydrogen bonds, and cohesion: surface tension and the pull up the xylem

BY THE END, STUDENTS CAN

- ☐ Explain why water is the medium for life: where the first cells arose, and where life's processes still happen A1.1.1
- ☐ Explain how unequal sharing of electrons makes water polar, and draw hydrogen bonds between water molecules with partial charges A1.1.2
- ☐ Explain how cohesion lets water be pulled up xylem under tension, and lets animals live on its surface A1.1.3

TIMING

0-5	5 min	Do now: wet hand, dry hand	
5-13	8 min	Life began in water	
13-28	15 min	Build it	
28-35	7 min	Bonds that flicker	
35-50	15 min	Cohesion	
50-60	10 min	Exit	
	60 min	One lesson	

STARTER

5 min

Do now: wet hand, dry hand

Students wet the back of one hand and blow on both. Which feels colder, and why? Take a vote and keep the answer: it comes back in the practical.

ON THE BOARD, FROM THE GUIDE

Open the guide on the projector at each chapter (the links work in this PDF). Every figure plays from its own buttons, and the lesson's slides have the same figures, step by step, in the order of this plan.

01 Life began in water, and still runs in it

CHAPTER 01 IN THE SLIDES

Step through the figure (4 steps, the arrow keys on a projector). Stop on each caption and ask what changed before you go on.

- Liquid **water** appeared very early, over 4 billion years ago.
- The **first cells** lived in it, more than 3.5 billion years ago, and for about three billion years every living thing stayed there.
- Plants and animals reached **land** only in the last 500 million years or so.
- Even there, life **carries** its water inside it: cells, blood plasma and xylem sap are all mostly water.

Predict box: A packet of dry bean seeds sits in a cupboard for three years. What is happening to the metabolism inside each seed? Hands up or mini whiteboards first.

Answer B: It has almost stopped: with so little water, enzymes and substrates cannot meet to react

02 A lopsided molecule makes hydrogen bonds

CHAPTER 02 IN THE SLIDES

Step through the figure (6 steps, the arrow keys on a projector). Stop on each caption and ask what changed before you go on.

1. One water molecule: an oxygen with two hydrogens, **bent**, with about 104.5° between the bonds.
2. The shared **electrons** (the pink cloud) crowd round the oxygen and thin out round each hydrogen.
3. So the oxygen is slightly negative and each hydrogen slightly positive: **partial** charges, not whole ones.
4. A second molecule turns its oxygen to face a hydrogen of the first, and a dashed line joins them: a **hydrogen bond**.
5. One molecule can make up to **four**: two through its hydrogens and two to its oxygen.
6. The notation the exam wants: letters, solid lines for covalent bonds, dashed lines for hydrogen bonds, and δ signs. **Draw it like this.**

Step through the figure (3 steps, the arrow keys on a projector). Stop on each caption and ask what changed before you go on.

1. Each water molecule is **polar**: the oxygen is slightly negative and the hydrogens slightly positive.
2. A slightly positive hydrogen is attracted to the oxygen of another molecule: a **hydrogen bond**.
3. Each bond lasts only a moment. They **break and form** all the time as the molecules move; in liquid water most molecules are held by several at once.

Predict box: Water boils in a kettle. Which bonds break as it turns to steam? Hands up or mini whiteboards first.

Answer C: The hydrogen bonds between molecules, so the steam is still made of water molecules

Remember it: Cats Avoid Taking Showers (Cohesion, Adhesion, Thermal, Solvent).

03 Water holds on to itself

CHAPTER 03 IN THE SLIDES

Step through the figure (5 steps, the arrow keys on a projector). Stop on each caption and ask what changed before you go on.

1. A pond skater stands on water. Its long legs spread its weight, and each foot makes a small **dimple** in the surface.
2. Inside the water, each molecule is pulled by its neighbours equally in **every direction**, so it stays where it is.
3. At the surface there are no neighbours above: the pull is **sideways and inwards**, and the surface holds together like a stretched film. That is **surface tension**.
4. Close up, water-repellent **hairs** on the foot press the film into a dimple without breaking it, and the film pushes back up.
5. A mosquito **larva** hangs from the underside of the film and breathes through a tube that pokes through it.

Play the animation, Watch it happen: pulling water up a stem. It loops; pause it on each moment below and ask what is happening (in the lesson slides it is a video).

1. Water **evaporates** from the wet cell walls in the leaf and escapes through a stoma.
2. Each molecule that leaves pulls on the next: **hydrogen bonds** hold the column together.
3. The whole column is pulled up from the roots, under **tension**.

Predict box: Ground pepper floats on a bowl of water. You touch the middle of the surface with a finger dipped in washing-up liquid. What does the pepper do? Hands up or mini whiteboards first.

Answer A: It shoots out to the edge of the bowl, dragged by the clean surface that is still pulling all round

THE LESSON

8
min

Life began in water

Play [chapter 1](#)'s timeline, then the seed predict box. Ask students to name three things happening in water inside their own bodies right now.

15
min

Build it

With snatoms or model kits, students build three water molecules, then annotate $\delta+$, $\delta-$ and dashed hydrogen bonds. Compare with [chapter 2](#)'s figure and draw the IB notation on mini whiteboards. Then the boiling predict box.

7
min

Bonds that flicker

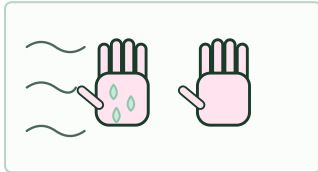
Open the water box under [chapter 2](#) and raise the temperature. Think, pair, share: why is it hard to prove that hydrogen bonds exist? Land on the boiling points of methane and hydrogen sulfide.

15
min

Cohesion

The pepper and soap demo, predicted first, then [chapter 3's](#) figure. Step through the pond skater, then show the xylem column and what an air bubble does to it.

ACTIVITIES

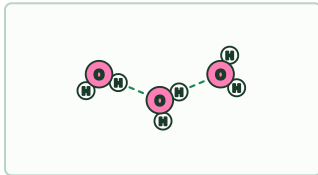


DEMO

Wet hand, dry hand

Students wet the back of one hand, blow on both, and say which is colder and why. Revisit it after [the dry lab](#), when the answer has numbers behind it.

Needs: water, paper towels.

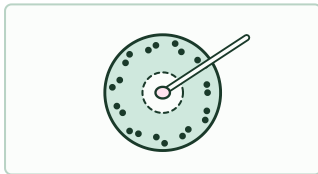


MODEL

Three water molecules

Build three molecules with snatoms or a kit, label δ^+ and δ^- , and link them with hydrogen bonds. Then compare the model with the drawing and say what the model gets wrong: electrons are a cloud, and bonds are not sticks.

Needs: snatoms or model kits (or plasticine and cocktail sticks), mini whiteboards.



DEMO

Pepper and soap

Predict first, then touch a soapy cotton bud to the middle of a bowl of water with pepper on it. Explain what happens with surface tension.

Needs: bowl, water, ground pepper, washing-up liquid, cotton buds.

PLENARY

10
min

Exit

Draw three water molecules with hydrogen bonds from memory. Then one sentence: which properties of water let it move up a plant against gravity?

WHAT STUDENTS GET WRONG

Hydrogen bonds are inside the molecule. They are between molecules, and the O–H bonds are covalent.

Writing + and – on water. They are partial charges: $\delta+$ and $\delta-$.

Boiling breaks water molecules. Only hydrogen bonds break, and steam is H₂O.

Capillary action lifts water up trees. Cohesion under tension does, and capillarity works in cell walls and soil.

Sweat cools because water has a high specific heat capacity. It cools because evaporation takes heat away (latent heat of vaporisation).

STRETCH AND SUPPORT

Support: give the IB notation as a template to trace, then to complete.

Support: sentence frames for property, cause and consequence: "Because water molecules are polar, ... This means that ..."

Support: use the Remember it tiles as a starter in each lesson.

Stretch: carbon dioxide has polar bonds but is not a polar molecule. Why? (Its shape is straight, so the charges cancel.)

Stretch: ammonia and hydrogen fluoride also form hydrogen bonds, yet water boils far higher than both. Why? (Two hydrogens and two places to accept: up to four bonds per molecule.)

IN THE GUIDE

- 1 [Life began in water, and still runs in it](#)
- 2 [A lopsided molecule makes hydrogen bonds](#)
- 3 [Water holds on to itself](#)
- A1.1 [The whole guide, with the figures that play](#)
- PPTX [This lesson's slides, in the order of this plan](#)

PRACTISE AND REVISE

BUILD FOR YOUR CLASS

- [Tarsia puzzle, dominoes and picture reveal](#) on A1.1, built from its key terms and ready to print
- A [pub quiz](#) with rounds on A1.1, to present or run with no projector
- An [escape room built from the question bank](#) on A1.1

ALREADY ON THE SITE FOR A1.1

- Lesson: [Water](#)
- Summary doodle: [Water](#)
- Quiz: [Water](#)
- Revision map: [A1.1 Water](#), to fill in
- Exam questions: [A1.1 in the exam maker](#), a paper with its markscheme

CARD SETS ON SPLYCR

Open a set to host it as a class game, or make a copy to edit.

- [A1.1 Water](#)

EXAM PRACTICE

Check yourself

Set it for homework: a fresh paper of exam-bank questions on A1.1 at standard level each time, marked as students go and saved to their Exam practice when they are signed in.

biologybybradford.com/exam-maker/sit?topics=A1.1&level=SL&paper=quiz&marks=15&src=ep



Sticky, soluble, and a place to live

60 minutes • A1.1.4 to A1.1.6 • Chapters 4, 5, 6

Adhesion and capillary action, water as the solvent, and water against air for the loon and the ringed seal

BY THE END, STUDENTS CAN

- ☐ Explain how adhesion draws water through soil and plant cell walls by capillary action A1.1.4
- ☐ Explain why water is the medium for metabolism and transport, and why some molecules work because they do not dissolve A1.1.5
- ☐ Compare water with air for buoyancy, viscosity, thermal conductivity and specific heat capacity, using the black-throated loon and the ringed seal A1.1.6

TIMING

0-5	5 min	Walking water challenge	
5-15	10 min	Paper that drinks	
15-30	15 min	The solvent	
30-50	20 min	Water against air	
50-55	5 min	Back to the cups	
55-60	5 min	Exit and homework	
	60 min	One lesson	

STARTER

5 Walking water challenge

min

Groups set up the cups (activity below) and leave them running while the lesson goes on.

ON THE BOARD, FROM THE GUIDE

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04 Water clings to polar surfaces

CHAPTER 04 IN THE SLIDES

Step through the figure (5 steps, the arrow keys on a projector). Stop on each caption and ask what changed before you go on.

1. Water is attracted to the polar glass wall and forms bonds with it: **adhesion**. The water's edge curves up where it meets the glass.
2. **Cohesion** drags more water up behind the edge, and the column rises until its weight balances the pull.
3. The **narrower** the tube, the higher the water climbs.
4. Wax has nothing for water to cling to: with no adhesion the surface curves down and sits **below** the level outside.
5. The same pull holds water between **soil** particles and soaks it through the gaps in a **cellulose** cell wall.

Predict box: Three cups in a row: red water, an empty cup, blue water. A strip of paper towel bridges each full cup and the empty one. What is in the middle cup a few hours later? Hands up or mini whiteboards first.

Answer C: Purple water, rising until the levels even out, because water creeps along paper from both sides

Remember it: Clones Anything (Cohesion, Adhesion).

05 The solvent cells run in

CHAPTER 05 IN THE SLIDES

Step through the figure (5 steps, the arrow keys on a projector). Stop on each caption and ask what changed before you go on.

1. A grain of salt is a lattice of **ions**, sodium (Na^+) and chloride (Cl^-), held together by their opposite charges.
2. Water molecules turn to face the ions, **oxygen** towards Na^+ and **hydrogens** towards Cl^- , and together they pull ions loose.
3. Dissolved: every ion is wrapped in its own **shell** of water molecules and drifts away from the rest.
4. A sugar is covered in OH groups, which make **hydrogen bonds** with water, so it dissolves too.
5. Oil molecules are **non-polar**. Water bonds to water, not to oil, so the oil is pushed together into a droplet.

Show the figure: Ten substances sorted: five dissolve in water and five do not. The five that do not are useful because of it: wax keeps water in the leaf, fat stores energy and insulates, cholesterol is part of membranes, cellulose makes cell walls that must not dissolve, and calcium phosphate makes bones that last.

Predict box: Fish get all their oxygen from water. Oxygen molecules (O_2) are non-polar. How does the oxygen get into the water? Hands up or mini whiteboards first.

Answer C: Small non-polar molecules dissolve a little, and a little is enough to reach the gills

06 Life in water, life in air

CHAPTER 06 IN THE SLIDES

Switch the figure through Buoyancy, Viscosity, Heat flow and Heat capacity, and have the class say what will change before each.

Predict box: Ringed seal pups are born in snow caves on the sea ice, with thick woolly fur but almost no blubber. What happens to a young pup that has to stay in the sea for a long time? Hands up or mini whiteboards first.

Answer B: It chills fast: soaked fur holds no air, and water draws heat away about 23 times faster than air does

Remember it: Big Vessels Turn Slowly (Buoyancy, Viscosity, Thermal conductivity, Specific heat capacity).

THE LESSON

10
min

Paper that drinks

Coffee filter painting at the tables, then [chapter 4's](#) figure: why does the waxed tube fail? Turn over the Clones and Anything tiles.

15
min

The solvent

[Chapter 5's](#) figure, then the sorter in pairs. Ask which molecules work because they do not dissolve, and what for. Finish with the oxygen predict box.

20
min

Water against air

[Chapter 6's](#) figure on the board, one property at a time. Pairs fill the loon and seal grid, then the pup predict box.

5
min

Back to the cups

What happened in the cups, and why: adhesion first, then cohesion.

ACTIVITIES



PRACTICAL

Coffee filter painting

Drop watercolour on to a filter paper one drop at a time and watch it spread. Explain the spreading with adhesion to cellulose and capillary action.

Needs: coffee filters or filter paper, watercolours or washable felt tips, droppers, plates.

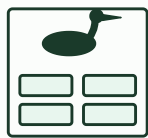


CHALLENGE

Walking water

With five cups, paper towel strips and red, yellow and blue water, make orange in one cup and purple in another: yellow, empty, red, empty, blue, with the red cup fuller. Explain it at the end of the lesson.

Needs: five clear cups per group, paper towels, food colouring.

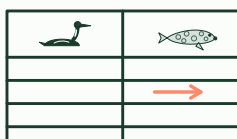


RESEARCH

An organism and its water

Choose a local species or a favourite. Outline its adaptations to at least three properties of water (cohesion, adhesion, surface tension, solvent, buoyancy, viscosity, thermal conductivity, specific heat capacity) in a one-page profile with a sketch. Finish with a gallery walk. This is an ATL research skills task.

Needs: devices or the library; a profile template with the properties as headings.

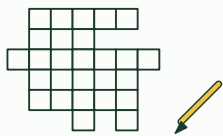


TABLE

Loon and seal: water against air

A grid of four properties by two animals, each cell split into in water and in air. Fill it from [chapter 6's](#) figure, then check it in pairs.

Needs: printed grid or exercise books.



PLENARY

Write a cryptic clue

Each student writes cryptic clues for three words from the keyword list, then swaps with a neighbour and solves.

Needs: the A1.1 key terms.

PLENARY

5
min

Exit and homework

Turn the Big Vessels Turn Slowly tiles back over and say what each stands for. Homework: research an organism and its water, and [the Check step](#).

WHAT STUDENTS GET WRONG

Cohesion and adhesion mixed up. Use Clones and Anything.

Water dissolves everything. Not fats, waxes, cellulose or bone mineral.

Hydrophilic means soluble. Cellulose is hydrophilic and insoluble.

Conductivity and heat capacity are the same. One is how fast heat flows, the other how much heat it takes to warm something.

Fur keeps seals warm in water. Blubber does, because wet fur fails.

STRETCH AND SUPPORT

Support: sentence frames for property, cause and consequence: "Because water molecules are polar, ... This means that ..."

Support: use the Remember it tiles as a starter in each lesson.

Support: give the [chapter 6](#) grid with the properties filled in.

Stretch: how high would capillary action lift water in a vessel 50 μm wide? Compare it with a 100 m tree.

Stretch: why are most large animals in cold water either well insulated or cold-blooded? Use thermal conductivity.

IN THE GUIDE

- 4** [Water clings to polar surfaces](#)
- 5** [The solvent cells run in](#)
- 6** [Life in water, life in air](#)
- A1.1** [The whole guide, with the figures that play](#)
- PPTX** [This lesson's slides, in the order of this plan](#)

PRACTISE AND REVISE

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CARD SETS ON SPLYCR

Open a set to host it as a class game, or make a copy to edit.

- [A1.1 Water](#)

EXAM PRACTICE

Check yourself

Set it for homework: a fresh paper of exam-bank questions on A1.1 at standard level each time, marked as students go and saved to their Exam practice when they are signed in.

biologybybradford.com/exam-maker/sit?topics=A1.1&level=SL&paper=quiz&marks=15&src=ep



Wet wicks, or water at the bench

60 minutes • Practical • The dry lab

What makes a wet surface cool: the wet wicks dry lab (or the bench stations), with repeats, mean, SD and SE

TIMING

0-5	5 min	The question	
5-20	15 min	Liquids compared	
20-35	15 min	The hand starter, measured	
35-45	10 min	Process	
45-60	15 min	Explain	
	60 min	One lesson	

STARTER

5 min **The question**
Name the independent, dependent and controlled variables together. Why a dry wick and an oil wick?

THE LESSON

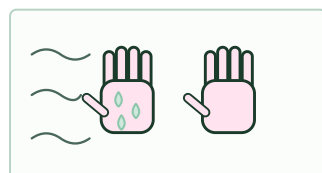
15 min **Liquids compared**
Pairs open [the dry lab](#) and run all four wicks in still air three times, recording each run. Students write their hypothesis for each wick before the first run.

15 min **The hand starter, measured**
In [the dry lab](#), fan on, then humidity at 20% and 80%. Each pair takes a different set-up, runs it three times, and the class pools its results on the board.

10 min **Process**
Work out one standard deviation and standard error by hand, check them against Graph your results in the lab, and draw a graph with error bars.

The same hour can run the bench stations (the activity below) instead, with [the dry lab](#) for homework.

ACTIVITIES

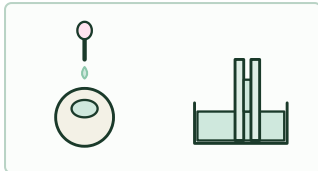


DEMO

Wet hand, dry hand

Students wet the back of one hand, blow on both, and say which is colder and why. Revisit it after [the dry lab](#), when the answer has numbers behind it.

Needs: water, paper towels.



PRACTICAL

Water at the bench

Four stations. Drops on a coin, water and soapy water, three trials each, with mean, SD and SE (cohesion). Capillary rise in tubes or straws of three widths (adhesion). What dissolves: salt, sugar, oil and sand (solvent). Water against dry sand warmed under a lamp, with the temperature taken every 2 minutes (heat capacity).

Needs: coins, droppers, washing-up liquid, capillary tubes or straws, beakers, salt, sugar, oil, sand, a lamp, thermometers.

DRY LAB

Wet wicks

The [dry lab](#), with the tasks and questions under it, and its results table as a CSV for a pooled class graph. Done for real, it needs probes or thermometers, gauze, water, ethanol (flammable: no flames), cooking oil, droppers and a desk fan.

Needs: one device per pair.

PLENARY

15

min

Explain

The three questions under the lab. Link the result to sweating and to leaves, and evaluate the method.

WHAT STUDENTS GET WRONG

Sweat cools because water has a high specific heat capacity. It cools because evaporation takes heat away (latent heat of vaporisation).

STRETCH AND SUPPORT

Stretch: in the [dry lab](#), predict the curve for a liquid that boils at about 97 °C, between ethanol and water, then reason about it.

IN THE GUIDE

Lab [Dry lab: Wet wicks: cooling by evaporation](#)

A11 [The whole guide, with the figures that play](#)

PPTX [This lesson's slides, in the order of this plan](#)

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PRACTISE AND REVISE

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- [A1.1 Water](#)

Water from space, and life beyond Earth HL

60 minutes • A1.1.7, A1.1.8 • Chapters 7, 8

Where Earth's water came from and why it stayed, and the Goldilocks zone in the search for life

BY THE END, STUDENTS CAN

- ☐ Outline how asteroids may have brought Earth's water, and why gravity and cool temperatures kept it A1.1.7
- ☐ Explain why the search for life elsewhere looks for liquid water in a star's Goldilocks zone A1.1.8

TIMING

0-5	5 min	Do now	
5-20	15 min	Where it came from	
20-30	10 min	Goldilocks	
30-45	15 min	The street light effect	
45-60	15 min	Exam question, timed	
	60 min	One lesson	

STARTER

5
min**Do now**

Why is there liquid water on Earth, but not on the Moon, Mars or Venus? Collect ideas without correcting them.

ON THE BOARD, FROM THE GUIDE

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07 Water from space, kept by gravity

CHAPTER 07 IN THE SLIDES

Step through the figure (5 steps, the arrow keys on a projector). Stop on each caption and ask what changed before you go on.

- The young Earth, about 4.5 billion years ago, is hot, with no oceans.
- Asteroids** crash into it. Some carry water locked inside their minerals, and they bring it to the planet.
- The water turns to vapour and fills the air. Earth's **gravity** holds it, and the rest of the atmosphere, in.
- Earth cools until the temperature is low enough for the vapour to **condense**. It rains, and oceans form.
- The Moon, at the same distance from the Sun, has too little gravity to hold water, and stays dry. Earth's oceans have lasted about four billion years.

Predict box: Venus is almost the same size and mass as Earth, but closer to the Sun. Why are there no oceans on Venus? Hands up or mini whiteboards first.

Answer A: It is too hot for water vapour to condense into liquid, so any water stayed in the air as vapour

Remember it: Grip Chill (Gravity, Cool enough to condense).

Step through the figure (4 steps, the arrow keys on a projector). Stop on each caption and ask what changed before you go on.

1. A star warms the planets round it. The pale band is its **Goldilocks zone**: the distances at which a planet's surface could keep liquid water.
2. Venus is closer than the zone's inner edge. It is **too hot**: water would boil away as vapour.
3. Mars is beyond the outer edge, and small. It is **too cold**: its water is frozen and its air is thin.
4. Earth is inside the zone: **just right** for liquid oceans.

Play the animation, Watch it happen: finding the zone. It loops; pause it on each moment below and ask what is happening (in the lesson slides it is a video).

1. **Too close**, and water boils away.
2. **Too far**, and it freezes.
3. In between, in the **Goldilocks zone**, water can stay liquid.

Predict box: A star gives out much less energy than the Sun. Where would its Goldilocks zone be? Hands up or mini whiteboards first.

Answer C: Much closer to the star, so that a planet there still receives enough energy to keep water liquid

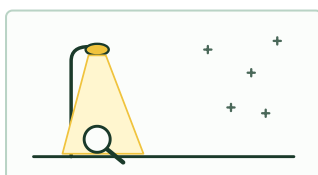
THE LESSON

15 min **Where it came from**
Chapter 7's figure, then the evidence card task. Then the Venus predict box and the Grip and Chill tiles.

10 min **Goldilocks**
Read the porridge line of the story, then chapter 8's figure and the dim star predict box. Pairs work the Goldilocks scene: move the planet, change the star, shrink the planet.

15 min **The street light effect**
Pairs argue for and against focusing the search on the Goldilocks zone, with Europa and Enceladus as test cases. Finish with a class vote.

ACTIVITIES



DISCUSSION · HL

Goldilocks and the street light

Start with the porridge line, then the zone. Then argue for and against searching only the zone, with Europa and Enceladus as test cases.

Needs: chapter 8 on screen.



EVIDENCE · HL

Where did the water come from?

Six cards to put in order as an argument: a hot young Earth; asteroids carrying water in their minerals; the matching heavy hydrogen ratio; the Moon too small to keep water; Venus too hot; oceans for four billion years.

Needs: printed cards.

PLENARY

15 min **Exam question, timed**
A higher level written question on A1.1.7 or A1.1.8 from the A1.1 exam maker (in Practise and revise, below), set at HL, then peer-marked. For homework, the Check step at HL.

WHAT STUDENTS GET WRONG

Every star's zone is where Earth is. It moves with the star.

In the zone means life. It means liquid water could exist.

STRETCH AND SUPPORT

Support: use the Remember it tiles as a starter in each lesson.

Stretch: Europa and Enceladus lie far outside the Sun's Goldilocks zone. What does that say about the zone as a model?

IN THE GUIDE

7 [Water from space, kept by gravity](#)

8 [Not too hot, not too cold: the Goldilocks zone](#)

A11 [The whole guide, with the figures that play](#)

PPTX [This lesson's slides, in the order of this plan](#)

PRACTISE AND REVISE

BUILD FOR YOUR CLASS

- [Tarsia puzzle, dominoes and picture reveal](#) on A1.1, built from its key terms and ready to print
- A [pub quiz](#) with rounds on A1.1, to present or run with no projector
- An [escape room built from the question bank](#) on A1.1

ALREADY ON THE SITE FOR A1.1

- Lesson: [Water](#)
- Summary doodle: [Water](#)
- Quiz: [Water](#)
- Revision map: [A1.1 Water](#), to fill in
- Exam questions: [A1.1 in the exam maker](#), a paper with its markscheme

CARD SETS ON SPLYCR

Open a set to host it as a class game, or make a copy to edit.

- [A1.1 Water](#)

EXAM PRACTICE

Check yourself

Set it for homework: a fresh paper of exam-bank questions on A1.1 at higher level each time, marked as students go and saved to their Exam practice when they are signed in.

biologybybradford.com/exam-maker/sit?topics=A1.1&level=HL&paper=quiz&marks=15&src=ep



How this was made. The course structure, the activities and the teaching choices come from my own classroom, my presentations and my years of teaching IB and AP Biology. I use Claude, an AI, to help write and build the interactive guides, lesson plans, slides and practice questions, and to draw the diagrams and code the interactives. I direct the work and review it against the IB and AP specifications before it goes live.