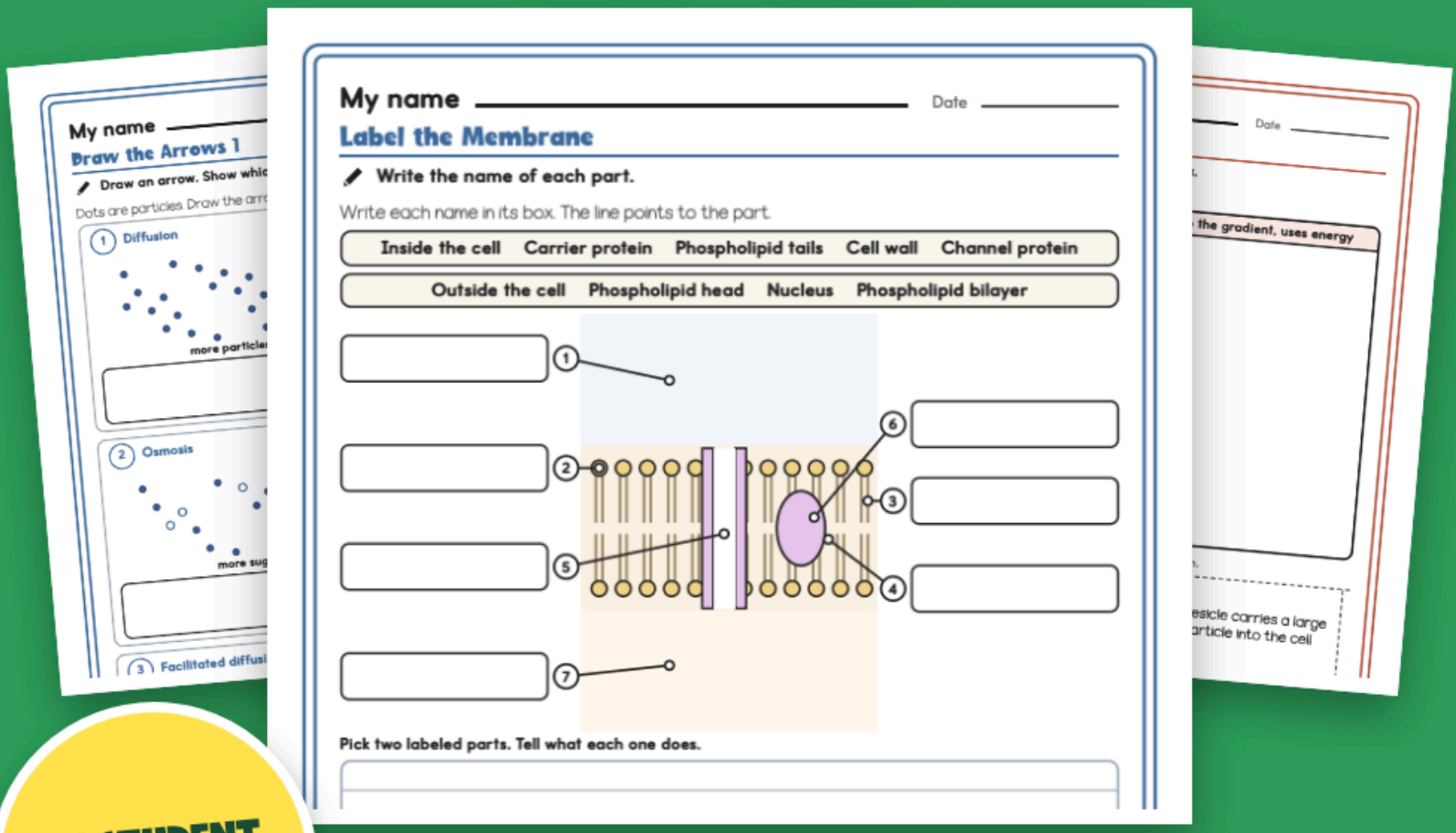
CELL TRANSPORT

WORKSHEETS · GRADES 6-8



24 STUDENT PAGES

Bright Path Sped

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This is a fillable PDF

- Open it in a PDF reader (Adobe Acrobat Reader, Preview, or your browser), click into a line or a box, type, and Save As.
- The name line, every answer box, every ruled work box and every check box on the student pages are type-in fields, and so are the tracker, class grid, team note and family page. You can also print any page and write by hand.
- It works offline. No account, no subscription, no internet connection needed after you download it.

Print at 100 percent

Turn off fit to page and shrink to fit so the ruled lines stay 0.34 inch apart. Every student page is black and white inside a colored border, so it still reads when copied in black and white.

Student work

A filled-in tracker, class grid or team note carries a real student's name. Keep it in the data folder, and use a first name only on any page that leaves your hands.

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PREVIEW

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How To Read a Page

The parts of a student page, then the kinds of sheet in the order they come.

The parts of a page

- **The answer box.** A bordered box for a letter, a number or a word. Click it to type, or print and write in it.
- **The ruled work box.** Lines 0.34 inch apart for sentences. Write one idea to a line.
- **The check box.** True or false, yes or not yet: click or mark.
- **The draw box.** The space under a picture. Draw the arrow there, from where the particles or water start to where they go.
- **The cut line.** Six pieces in a 3 by 2 grid, each 2.4 by 1.15 inches, edge to edge: one cut across and two down.

Kind of sheet	How many	What the student does
Readings and cards	4 sheets	Read, answer, and keep the six transport cards to look things up.
Words and matching	4 sheets, 22 items	Match words and processes; try a worked example.
Labels and arrows	3 sheets, 13 items	Label the membrane, then draw which way each process moves.
Beakers and scenarios	2 sheets, 12 items	Predict what a cell does in three solutions; match each scenario.
True or false and quizzes	4 sheets, 24 items	Check sentences, fix false ones, answer two quizzes.
Mistakes and writing	3 sheets, 10 items	Find Sam's mistakes; answer in full sentences.
Exit, self check, sorts	4 sheets, 12 pieces	Exit tickets, a self check, and two cut-and-paste sorts.

PREVIEW

Untimed, unscored on the page

No student page has a timer or a score on it. The keys and the tracker are for you. The answer keys are on pages 29 to 33.

Short answers

Their keys (page 33) say what to look for, not one right sentence. Accept any answer that uses a fact from the readings or the cards.

Printing and the type-in fields

Every page prints clean in black and white. Each answer box, ruled box and check box is a type-in field: click, type, then save. This is a fillable PDF, not a slideshow.

Room to work

Work boxes hold three or four lines. If a student needs more room, let them write on scrap paper and copy their best sentence into the box.

Preview · Bright Path Sped

My name _____ Date _____

Reading 1: The Cell Membrane

Read about the cell membrane. Then answer.

The gate around the cell

Every cell is wrapped in a **cell membrane**, a thin barrier that separates the inside of the cell from the outside. The membrane is mostly a double layer of **phospholipids**. Each phospholipid has a head that likes water and two tails that do not. **Proteins** are scattered through the layer. Some proteins form channels, and some carry molecules across. The membrane is **selectively permeable**: it lets some substances pass and keeps others out. Small molecules such as oxygen and carbon dioxide can slip through the lipid layer. Ions and large molecules usually need a protein to help them cross.

Main idea: What is this reading mostly about?

Check what you read. Write the letter in the box.

1. What is the cell membrane mostly made of?
   - **A** A double layer of phospholipids
   - **B** A layer of sugar only
   - **C** A stiff wall of cellulose

2. What does selectively permeable mean?
   - **A** It lets everything pass freely
   - **B** It stops all water
   - **C** It lets some substances pass and keeps others out

3. Which kind of molecule usually needs a protein to cross?
   - **A** Oxygen
   - **B** Ions and large molecules
   - **C** Carbon dioxide

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Reading 3: Active and Bulk Transport

Read about active transport. Then answer.

Up the gradient, with energy

Active transport moves substances from low to high concentration, against the gradient. That takes energy, usually from ATP. **Protein pumps** do this work. Bulk transport moves very large particles, or many molecules at once. In **endocytosis**, the cell membrane folds around a substance outside the cell and pinches off a small sac, a **vesicle**, that carries it inside. In **exocytosis**, a vesicle moves to the membrane, joins with it and releases its contents outside the cell. Endocytosis and exocytosis both use energy.

Main idea: What is this reading mostly about?

Check what you read. Write the letter in the box.

1. Which way does active transport move substances?
   - **A** From high to low, with the gradient
   - **B** Only by osmosis
   - **C** From low to high concentration, against the gradient

2. What does active transport need?
   - **A** Energy, usually from ATP
   - **B** Nothing, because it is passive
   - **C** Only sunlight

3. What happens in exocytosis?
   - **A** A pump pulls a particle inside the cell
   - **B** A vesicle joins the membrane and releases its contents outside the cell
   - **C** The membrane pinches off a vesicle inside the cell

PREVIEW

My name _____ Date _____

Worked Example: Which Way?

Read the example. Then try one.

How to find the process

Read the clue. Find the key words. Look at the six transport cards (page 10) for the job that matches. Then check the energy.

Example. The clue is made up for practice.

Start

Read the clue.

The cell uses energy to move a sugar molecule from a place with little sugar to a place with a lot of sugar.

Step 1

Look for key words.

"uses energy" and "from little to a lot"

Step 2

Up the gradient, or down?

Up. It moves from little to a lot, so it goes against the gradient.

Step 3

Name the process.

Active transport

Check

Does it need energy?

Yes. Active transport uses energy, usually from ATP.

Your turn. Do the same steps.

Start

Water moves across a selectively permeable membrane toward the side with more sugar, and the cell uses no energy.

Step 1

Write the key words. _____

Step 2

Which way does the water move? _____

Step 3

Which process is it? Write its name. _____

Check

Does the cell need energy? Check one. ☐ yes ☐ no

PREVIEW

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My name _____ Date _____

Match Word to Meaning

Write the letter of the meaning for each word.

Write the letter of the meaning in the box. Use the transport cards to help you.

1	**Diffusion**		**A**	A vesicle joins the membrane and releases material outside.
2	**Osmosis**		**B**	A channel or carrier protein helps molecules move down the gradient.
3	**Facilitated diffusion**		**C**	The difference in concentration between two areas.
4	**Active transport**		**D**	Particles spread from high to low concentration.
5	**Endocytosis**		**E**	A protein pump moves molecules up the gradient, using energy.
6	**Exocytosis**		**F**	Movement down the gradient that uses no cell energy.
7	**Passive transport**		**G**	Water crosses a selectively permeable membrane.
8	**Concentration gradient**		**H**	The membrane folds around material and brings it in.

Pick one process. Tell why a cell needs it.

PREVIEW

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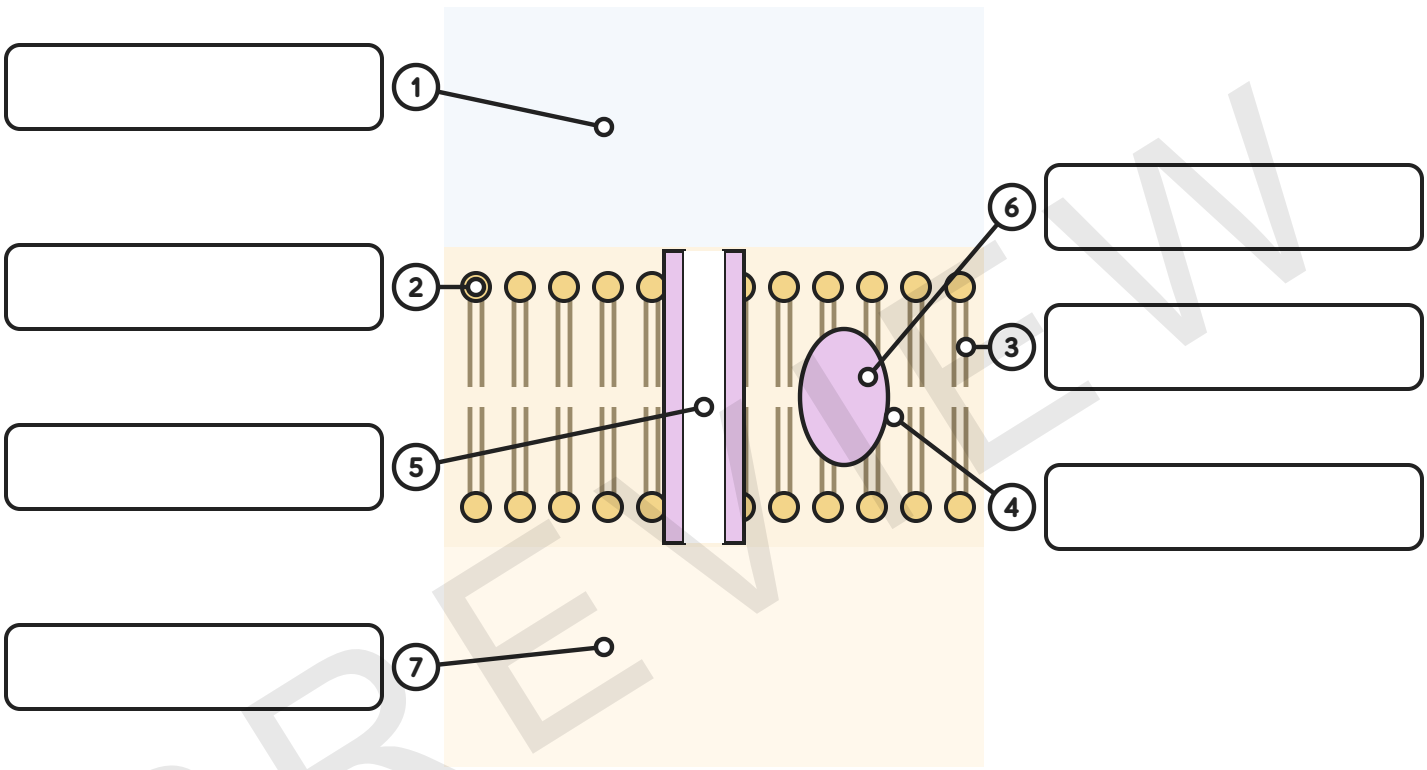
My name _____ Date _____

Label the Membrane

Write the name of each part.

Write each name in its box. The line points to the part.

Inside the cell	Carrier protein	Phospholipid tails	Cell wall	Channel protein
Outside the cell	Phospholipid head	Nucleus	Phospholipid bilayer	



Pick two labeled parts. Tell what each one does.

PREVIEW

My name _____ Date _____

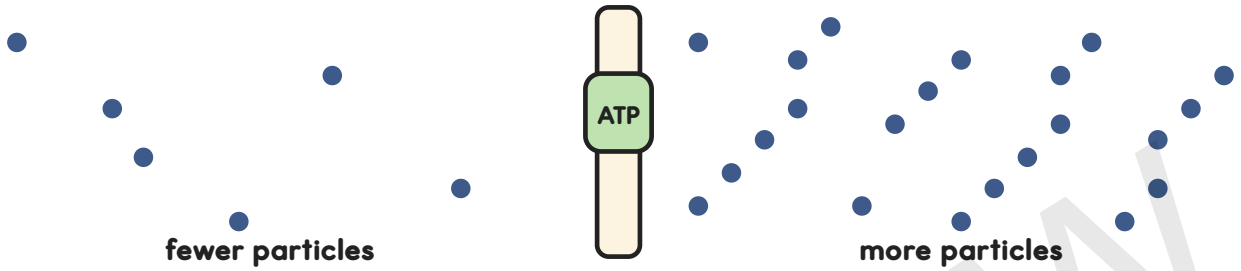
Draw the Arrows 2

Draw an arrow. Show which way it moves.

Dots are particles. Draw the arrow in the box under each picture.

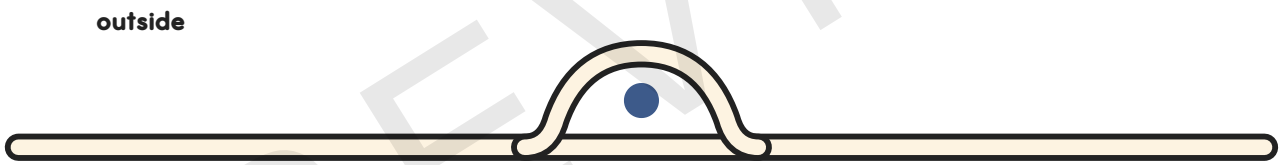
4 Active transport

The pump uses ATP. Draw the arrow.



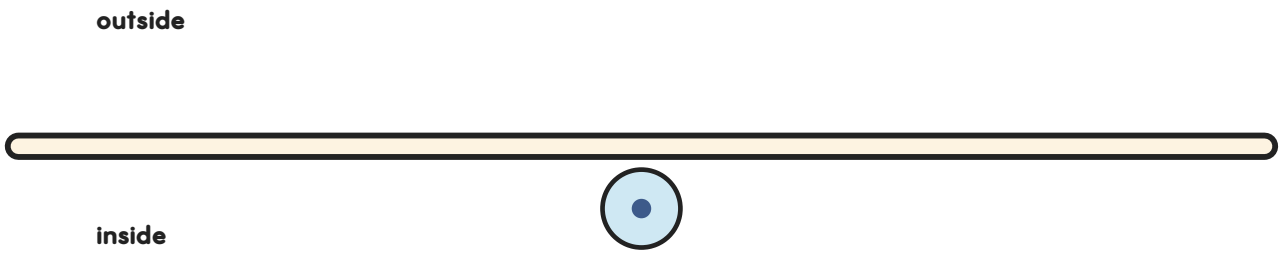
5 Endocytosis

The membrane pulls material in. Draw the arrow.



6 Exocytosis

The vesicle releases what it holds. Draw the arrow.



PREVIEW

My name _____ Date _____

Scenario Match

Write the letter of what happens to the cell.

What happens to the cell? Write the letter from the word bank.

A. Swells B. Shrinks C. Stays the same

1. A cell is placed in pure water. ☐
2. A cell is placed in salt water that is much saltier than the inside of the cell. ☐
3. A cell is placed in a solution with the same solute concentration as its cytoplasm. ☐
4. A cell is placed in weak sugar water, with less sugar than the inside of the cell. ☐
5. A cell is placed in a very strong salt solution. ☐
6. A cell is placed in a drink with the same mix of dissolved particles as its cytoplasm. ☐

Pick one scenario. Tell what the water is doing.

PREVIEW

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My name _____ Date _____

True or False 2

Is it true or false? Check one.

Check true or false for each sentence.

7. Facilitated diffusion uses a protein to help molecules cross the membrane. ☐ true ☐ false

8. Facilitated diffusion needs ATP to work. ☐ true ☐ false

9. Endocytosis brings material into the cell. ☐ true ☐ false

10. In an isotonic solution, the cell swells. ☐ true ☐ false

11. Water moves toward the side with more solute. ☐ true ☐ false

12. A hypertonic solution has less solute than the inside of the cell. ☐ true ☐ false

Pick one false sentence. Fix it so it is true.

PREVIEW

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My name _____ Date _____

Find the Mistake

Find the mistake. Then fix it.

Sam is made up for practice. Each sentence has one mistake.

1 **Sam wrote:**

"Active transport moves particles down the concentration gradient without energy."

What is wrong?

Write it the right way.

2 **Sam wrote:**

"Osmosis is the movement of salt across a membrane."

What is wrong?

Write it the right way.

3 **Sam wrote:**

"In a hypotonic solution, water leaves the cell and the cell shrinks."

What is wrong?

Write it the right way.

4 **Sam wrote:**

"Exocytosis brings large particles into the cell."

What is wrong?

Write it the right way.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Short Answers 2

Answer each question in sentences.

Use facts from the readings and the cards. Write in sentences.

4 The cell membrane lets oxygen through easily but blocks many large molecules. Explain why.

5 A cell sits in salt water that is hypertonic to it. What happens to the water, and to the cell's shape?

6 Why does a cell need energy to move some substances but not others?

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Check My Own Work

Check your own work. Mark yes or not yet.

1	I can say what the cell membrane is made of and what selectively permeable means.	☐ yes	☐ not yet
2	I can explain diffusion and say which way it moves particles.	☐ yes	☐ not yet
3	I can explain osmosis and say which way water moves.	☐ yes	☐ not yet
4	I can tell passive transport from active transport.	☐ yes	☐ not yet
5	I can explain facilitated diffusion.	☐ yes	☐ not yet
6	I can tell endocytosis from exocytosis.	☐ yes	☐ not yet
7	I can predict what happens to a cell in a hypotonic, isotonic or hypertonic solution.	☐ yes	☐ not yet
8	I can say which way a substance moves on an arrow diagram.	☐ yes	☐ not yet

The process I can explain best is...

The part I still need help with is...

PREVIEW

My name _____ Date _____

Cut and Paste 2: Beakers

Cut out the six pieces. Paste each one in the right box.

Read each piece. Which kind of solution is it?

Hypotonic: less solute outside	Isotonic: equal solute	Hypertonic: more solute outside

Cut on the dashed lines: six pieces, one cut across and two cuts down.

Salt water much saltier than the cell; the cell shrinks	Pure water; water moves in and the cell swells	Equal solute on both sides; no overall movement
Weak sugar water with less sugar than the cell	A very strong salt solution pulls water out of the cell	Solute the same inside and outside; the cell stays the same

Which piece told you the most? Why?

PREVIEW

Answer Key: Labels, Arrows, Worked Example

Box numbers match the numbers on the diagram. For the arrows, accept any drawing that points the same way.

Label the Membrane page 13

Box	Name	Where it is
1	Outside the cell	Above the membrane
2	Phospholipid head	The water-loving end of a phospholipid
3	Phospholipid tails	The water-fearing middle of the double layer
4	Phospholipid bilayer	The double layer of phospholipids
5	Channel protein	A protein tube that lets a molecule through
6	Carrier protein	A protein that grabs a molecule and moves it across
7	Inside the cell	Below the membrane

Worked Example: your turn page 9

Step	Answer
Step 2: which way the water moves	Toward the side with more sugar
Step 3: the process	Osmosis
Check: energy	No. Osmosis is passive, so the cell uses no energy.

Draw the Arrows pages 14 and 15

Item	The arrow
14.1: Diffusion	From the left (more dots) to the right (fewer dots). Dots move from high to low.
14.2: Osmosis	The water moves left, toward the side with more sugar. Water is what moves in osmosis.
14.3: Facilitated diffusion	From the left (more dots) to the right, through the channel. No energy is used.
15.4: Active transport	From the left (fewer dots) to the right (more dots): against the gradient. The pump uses energy.
15.5: Endocytosis	Down, into the cell: the membrane folds around the material and brings it inside.
15.6: Exocytosis	Up, out of the cell: the vesicle joins the membrane and releases its contents outside.

Which way each arrow points

- Diffusion, osmosis and facilitated diffusion are passive: the arrow points down the gradient, or toward the side with more solute for water.
- Active transport is the one that points up the gradient, from fewer dots to more, and it uses ATP.
- Endocytosis points into the cell; exocytosis points out.

PREVIEW

Answer Key: Quizzes and Mistakes

Sam in Find the Mistake is invented. Accept any wording that fixes a false sentence or a mistake.

Quizzes pages 20, 21

Item	Letter	Answer
20.1	A	Osmosis
20.2	C	Active transport
20.3	B	Endocytosis
20.4	A	It lets some substances pass and keeps others out
20.5	C	From high to low concentration
20.6	B	It moves substances down the gradient with no cell energy
21.1	B	Concentration gradient
21.2	A	It swells, because water moves in
21.3	C	The dissolved substance, such as salt or sugar
21.4	A	A channel or carrier protein
21.5	B	A vesicle that joins the cell membrane
21.6	C	One with more solute than the inside of the cell

Find the Mistake page 22

Item	What went wrong	Right sentence
22.1	Down the gradient with no energy describes passive transport, not active.	Active transport moves particles up the gradient, and it needs energy.
22.2	Osmosis is the movement of water, not salt.	Osmosis is the diffusion of water across a selectively permeable membrane.
22.3	In a hypotonic solution the water moves into the cell, so the cell swells.	In a hypotonic solution, water moves into the cell and the cell swells.
22.4	Exocytosis sends material out. Endocytosis brings it in.	Endocytosis brings large particles in. Exocytosis sends them out.

PREVIEW

Cell Transport Tracker

One student, every scored sheet. Filled example: page 38.

Student _____ Teacher _____ Month _____

Page	Page type and set	Items	Right	Date	Notes
5	Reading 1: The Cell Membrane	3			
6	Reading 2: Passive Transport	3			
7	Reading 3: Active and Bulk Transport	3			
8	Transport Words	6			
11	Match Word to Meaning	8			
12	Who Am I?	8			
13	Label the Membrane	7			
14	Draw the Arrows 1	3			
15	Draw the Arrows 2	3			
16	Beaker Predictions	6			
17	Scenario Match	6			
18	True or False 1	6			
19	True or False 2	6			
20	Quiz A	6			
21	Quiz B	6			
22	Find the Mistake	4			
27	Cut and Paste 1: Which Way	6			
28	Cut and Paste 2: Beakers	6			

How to fill this in

Write how many items the student got right with no prompt, and the date. A blank means not tried yet, never wrong. There are 96 items on the 18 scored sheets. Answer keys: pages 29 to 33. Filled example: page 38.

This month we are working on (your own standard or wording)

PREVIEW

Team Note

Use this page between team meetings or when a student moves classes, to hand off what changed without writing a note from scratch. Everything below is observable, with a blank for the number or the wording your team already uses.

Student _____ Team member _____ Date _____

Kind of sheet	Covered since last note (Y/N)	Items right	Still blank
Readings			
Matching			
Labels and arrows			
Beakers			
True or false			
Quizzes			
Mistakes			
Sorts			

What I saw (observable, not a conclusion)

- Matched ___ of 16 items (pages 11, 12).
- Labeled ___ of 7 parts, and drew ___ of 6 arrows in the right direction (pages 13 to 15).
- Got ___ of 12 true or false sentences right (pages 18, 19).
- Explained one process in a complete sentence: yes / no / with a reminder.

Next step

- Next page or set: ___, because ___ (what you saw).
- What to try in another class or at home: ___.
- What to keep doing because it is working: ___.
- Anything for the team meeting to decide: ___ (this page records what happened, never a label or a plan).

Summary, in one or two sentences, for whoever reads this next

A filled-in line, for reference

"Got 4 of 6 true or false sentences right on 10/15. Next step: reread Reading 2 and ask which way water moves in osmosis." That is the level of detail this page is built for. It matches the filled example on page 38.

PREVIEW

Maya's Tracker (Invented Student)

Maya R. is invented; nothing on this page describes a real student. The blank tracker is on page 34.

Student	Teacher	Month
Maya R. (an invented student)	Mr. Lind (invented)	October

Page	Page type and set	Items	Right	Date	Notes
5	Reading 1: The Cell Membrane	3	3	10/6	-
6	Reading 2: Passive Transport	3	2	10/7	Thought diffusion needs energy
7	Reading 3: Active and Bulk Transport	3	-	-	-
8	Transport Words	6	5	10/8	Mixed up solute and vesicle
11	Match Word to Meaning	8	6	10/9	Swapped osmosis and diffusion
12	Who Am I?	8	-	-	-
13	Label the Membrane	7	4	10/13	Missed the carrier protein and the inside of the cell
14	Draw the Arrows 1	3	2	10/14	Drew the water arrow to the right
15	Draw the Arrows 2	3	-	-	-
16	Beaker Predictions	6	4	10/15	Said the cell shrinks in the strong salt beaker
17	Scenario Match	6	-	-	-
18	True or False 1	6	4	10/15	Thought active transport goes down the gradient
19	True or False 2	6	-	-	-
20	Quiz A	6	5	10/20	Mixed up endocytosis and exocytosis
21	Quiz B	6	-	-	-
22	Find the Mistake	4	-	-	-
27	Cut and Paste 1: Which Way	6	6	10/22	-
28	Cut and Paste 2: Beakers	6	-	-	-

How to read it

Maya R. has done **10 of 18** scored sheets and got **41 of 54** items right with no prompt. **2** sheets were all right and **8** carry a note. Every number comes from the table.

What the table points to

The lowest sheets are Label the Membrane (4 of 7). Those are where the next practice goes. The 8 sheets left blank are not tried yet, never wrong.

PREVIEW