HOMEOSTASIS

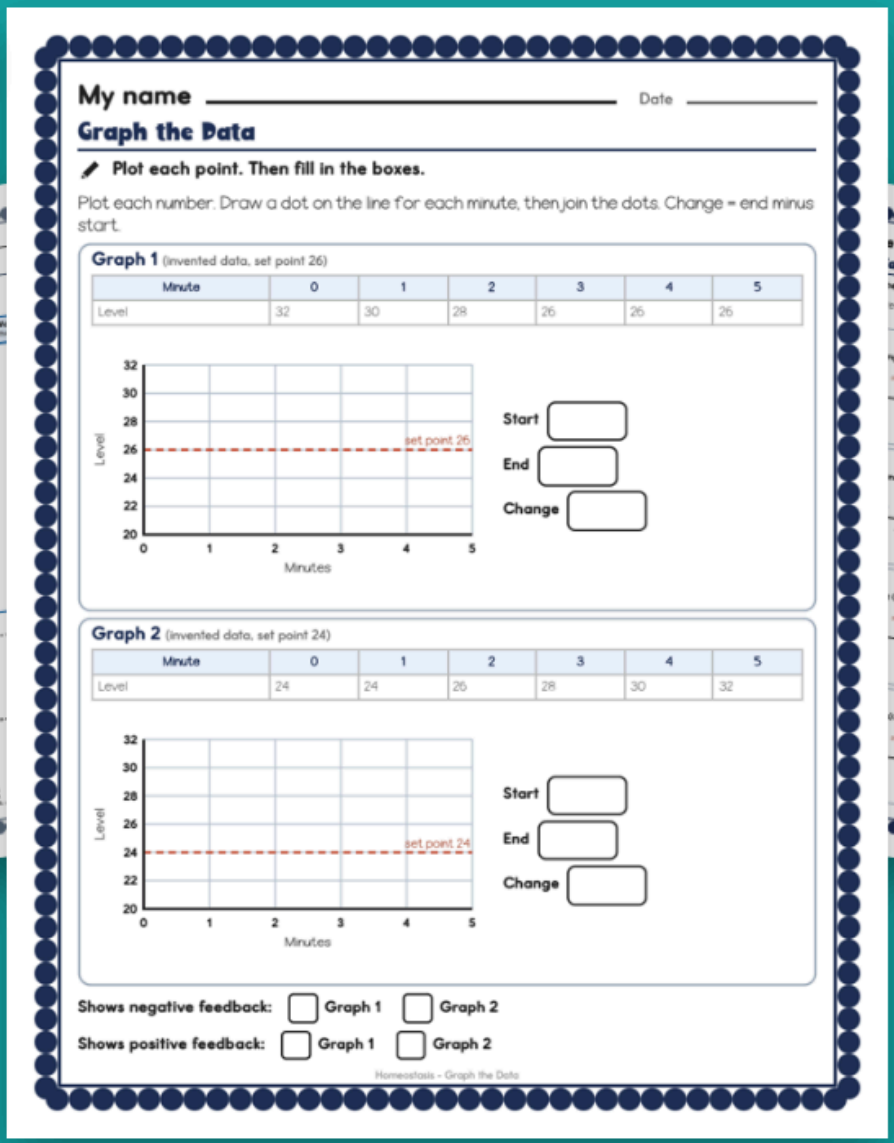
FEEDBACK LOOPS, SORT, DIAGRAMS - GRADES 6-8

150 ITEMS

44 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.
- Every name line, answer box, check box and ruled box on the student pages is a type-in field, and so are the tracker and the other record pages. You can also print any page and write by hand. Print the graph page to plot the points in pencil.
- It works offline, with no account needed.

Print at 100 percent

Turn off fit to page and shrink to fit so the ruled lines stay 0.34 inch apart. Negative feedback is blue and positive feedback is red-orange, and every box also carries the words, so a black and white copy reads too.

Student work

A filled-in tracker, class grid or team note carries a real student's name. Keep it in the data folder.

Need help?

If a field will not behave or a page will not print the way you expect, use Ask a Question on the product page before leaving a review. A fix to the file ships as a free update from My Purchases.

PREVIEW

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Teacher Notes

The parts of a student page, the page types in order, and a few teaching notes.

The parts of a page

- **The color code.** Negative feedback is blue and positive feedback is red-orange on the reference page, the graphs, the sort mats and the keys. The parts of a loop are green.
- **The answer box.** A bordered box. Click it to type, or print and write in it.
- **The check box.** Negative or positive feedback; true or false; and the quiz choices.
- **The ruled work box.** Lines 0.34 inch apart, one idea to a line.
- **The cut lines.** Mats 1 and 2: 6 pieces in 3 across by 2 down, each 2.4 by 1.46 inches. Mat 3: 10 pieces, 5 across by 2 down, each 1.46 by 1.15 inches. Edge to edge.

Page type	What it looks like	What the student does
The Feedback Loop; Words	2 pages, 6 items	A loop diagram, a thermostat compared with a model body, then six words to match.
Read: five short readings	5 pages, 25 items	Homeostasis, body temperature, blood sugar, water, negative and positive feedback.
Which Way Back?	1 page, 8 items	Read a number line: which way must the loop push, and how far.
Worked Example	1 page, 3 items	Four steps on a filled loop, then a Your Turn on a graph.
Name the Feedback 1 and 2	2 pages, 16 items	Everyday examples, then clues.
Fill In the Loop 1, 2 and 3	3 pages, 19 items	Five loops with some boxes printed and some empty; a word bank on each page.
Read the Data Table; Graph the Data	2 pages, 14 items	Find the change in three rooms; plot two runs.
Fix It 1 and 2	2 pages, 10 items	True or false; rewrite each false statement.
Claim, Evidence, Reasoning 1 and 2	2 pages, 12 items	Four short scenarios with invented numbers.
Quiz; Short Answer	2 pages, 15 items	Ten choices, then five written answers.

Two steps, marked by a shape

- **Circle.** Name the Feedback 1 (page 14): everyday examples in a sentence.
- **Triangle.** Name the Feedback 2 (page 15): short clues, no story to lean on.

Teaching notes

- Say it every day: **stimulus, receptor, control center, effector, response**. Then ask: did the response reverse the change or add to it?
- Students often hear negative as bad. Fix It 2 asks them to rewrite that idea: the words tell the direction of the response, not good or bad.
- The loops here are simplified on purpose, and real body systems have more parts. Use your own words for the details your class needs.
- All numbers are invented for practice. No lab procedure is included, and nothing here is health advice.

PREVIEW

Preview - Bright Path Sped

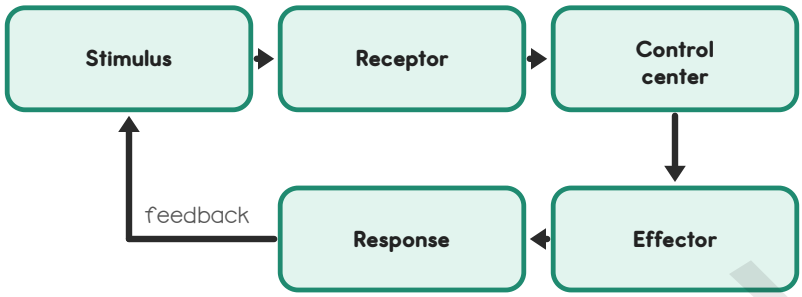
My name _____ Date _____



The Feedback Loop

Read about the loop. Keep this page next to you.

A **feedback loop** keeps a level steady. **Homeostasis** is keeping conditions in balance.



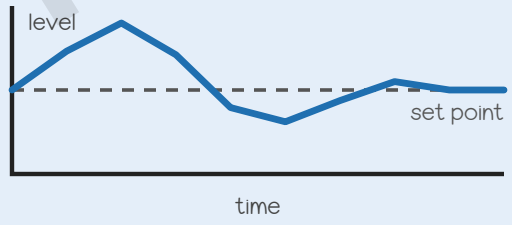
Part of the loop	A thermostat	A model body
Stimulus	the room gets too cold	the body gets too warm
Receptor	a thermometer	sensors in the skin
Control center	the thermostat	the brain
Effector	the heater	the sweat glands
Response	the room warms up	sweating cools the body

Negative feedback

What it does The response reverses the change.

Result The level comes back to the set point.

Example sweating when too warm.

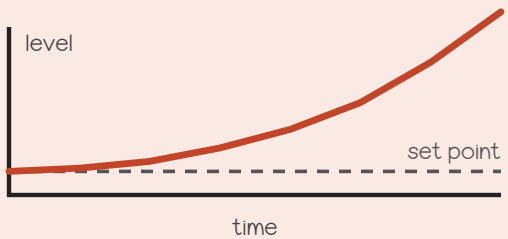


Positive feedback

What it does The response makes the change bigger.

Result The level runs away from where it began.

Example a microphone squeal.



PREVIEW

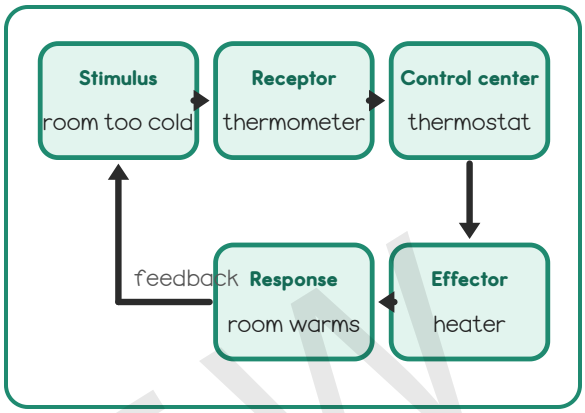
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My name _____ Date _____

Read: What Is Homeostasis?

Read. Then answer the questions.

Your body works best when the conditions inside it stay steady. Homeostasis means keeping those conditions in balance, such as temperature, sugar and water. Each condition has a set point, the level the body works to keep. Conditions change all the time, so the body is always checking and adjusting. A thermostat works in a similar way: it checks the room, compares it to the set point and turns a heater on or off. Homeostasis does not mean that nothing changes. It means that changes get corrected.



1 What does homeostasis mean?

☐ **keeping the body steady** ☐ **stopping every change** ☐ **making it colder**

2 A set point is...

☐ **the level the body works to keep** ☐ **a kind of food** ☐ **a sensor**

3 Conditions inside the body...

☐ **change all the time** ☐ **never change**

4 What does a thermostat do with the room temperature?

_____

5 Name one condition the body keeps in balance.

_____

PREVIEW

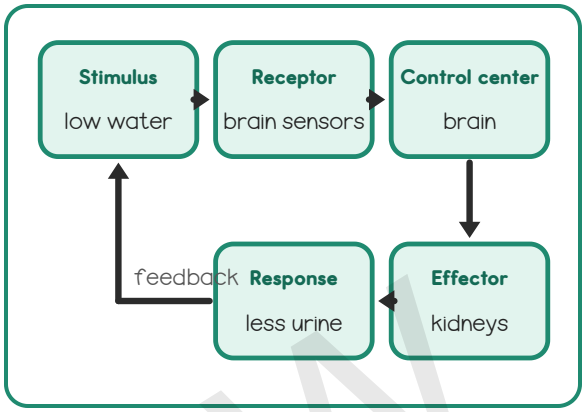
Preview - Bright Path Sped

My name _____ Date _____

Read: Water Balance

Read. Then answer the questions.

Your body needs a steady amount of water. When you lose water, for example by sweating, the amount of water in the blood falls. Sensors in the brain notice. The brain, the control center, makes you feel thirsty and tells the kidneys to save water, so less water leaves in urine. When you drink, the amount of water rises again. If there is too much water, the kidneys let more water leave. The loop works in both directions.



1. What can make the body lose water?

☐ **sweating** ☐ **sleeping** ☐ **reading**

2. What does the brain make you feel when the body needs water?

☐ **sleepy** ☐ **thirsty** ☐ **cold**

3. What do the kidneys do when the body is low on water?

☐ **save water** ☐ **send out more water** ☐ **make sugar**

4. What do the kidneys do when there is too much water?

_____

5. Why does the loop work in both directions?

_____

PREVIEW

Preview - Bright Path Sped

My name _____ Date _____

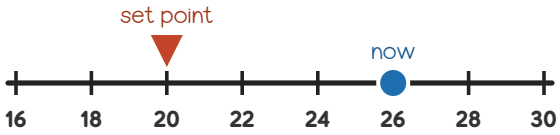
Which Way Back?

Look at the number line. Which way must the loop push?

The numbers are made up for practice. A negative feedback loop pushes the level back toward the set point.

1

Room temperature (degrees): set point 20, now 26



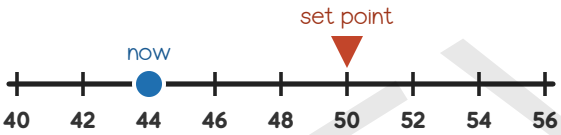
The loop must make it

☐ go down ☐ go up ☐ stay

How far from the set point? ☐

2

Water in a tank (centimeters): set point 50, now 44



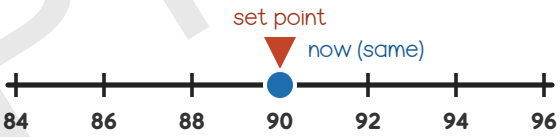
The loop must make it

☐ go down ☐ go up ☐ stay

How far from the set point? ☐

3

A steady reading (units): set point 90, now 90



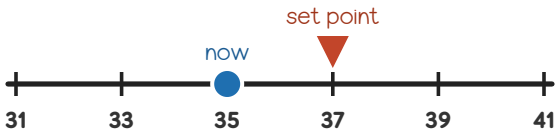
The loop must make it

☐ go down ☐ go up ☐ stay

How far from the set point? ☐

4

Body model (degrees): set point 37, now 35



The loop must make it

☐ go down ☐ go up ☐ stay

How far from the set point? ☐

PREVIEW

Preview - Bright Path Shed

My name _____ Date _____

Name the Feedback 1

Check one box for each one. Write how you know.

Does the response reverse the change, or make it bigger?

1. Your body is too warm, so you sweat and cool down.

☐ **negative feedback** ☐ **positive feedback** **I know because** _____

2. A microphone picks up its own sound from a speaker, and the sound grows louder and louder.

☐ **negative feedback** ☐ **positive feedback** **I know because** _____

3. A thermostat turns the heater off when the room reaches the set point.

☐ **negative feedback** ☐ **positive feedback** **I know because** _____

4. A ripe fruit gives off a gas that makes nearby fruit ripen, and those fruits give off more.

☐ **negative feedback** ☐ **positive feedback** **I know because** _____

5. After a meal, blood sugar rises and the body moves sugar out of the blood.

☐ **negative feedback** ☐ **positive feedback** **I know because** _____

6. A snowball rolls downhill, picks up snow, gets bigger and rolls faster.

☐ **negative feedback** ☐ **positive feedback** **I know because** _____

7. You shiver when you are too cold, and the shivering warms you.

☐ **negative feedback** ☐ **positive feedback** **I know because** _____

8. Too little water makes you thirsty, so you drink, and the water amount goes back up.

☐ **negative feedback** ☐ **positive feedback** **I know because** _____

PREVIEW

Preview - Bright Path Sped

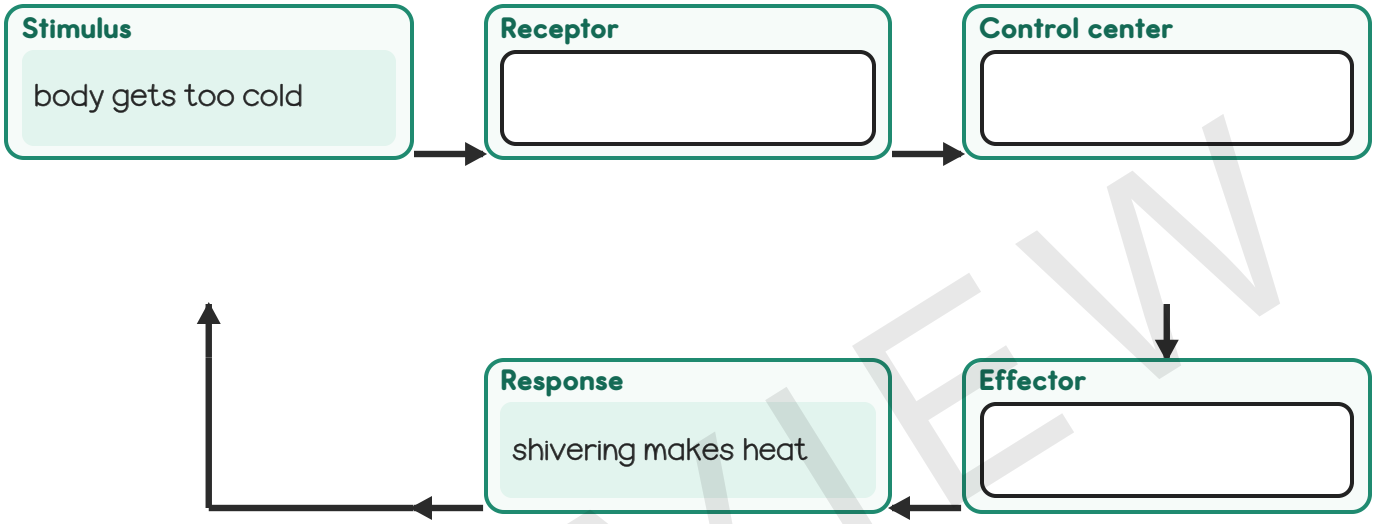
My name _____ Date _____

Fill In the Loop 2

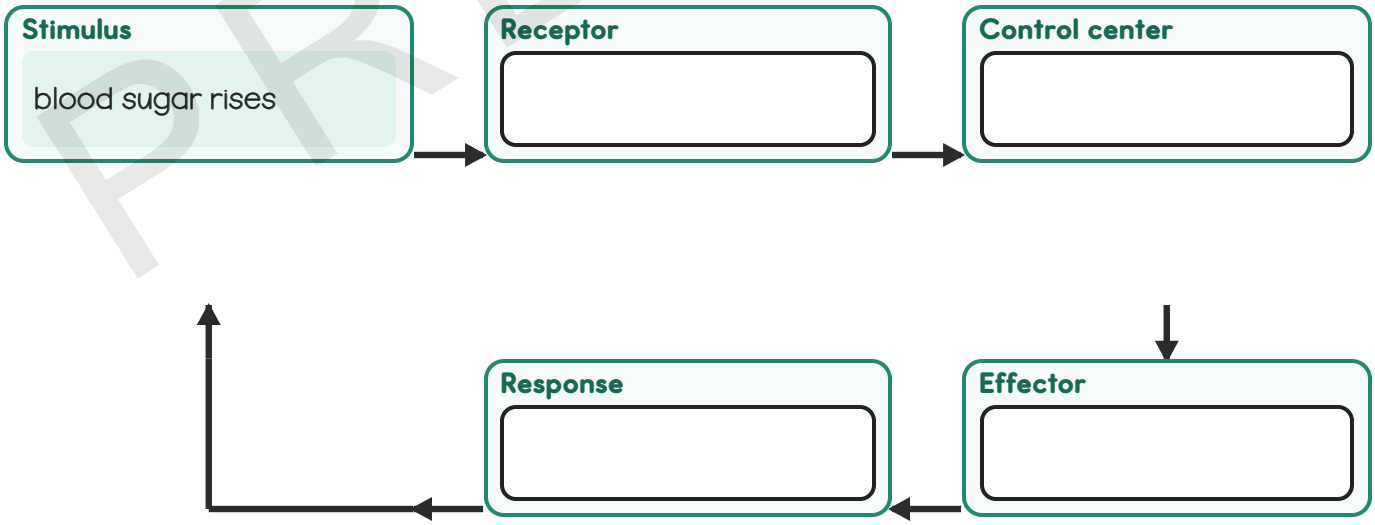
Fill in the empty boxes. Use the word bank.

Word bank **pancreas** **skin sensors** **sugar leaves the blood** **muscles** **liver and muscle cells** **brain** **sensors**

The body gets too cold (a model)



Blood sugar rises after a meal



PREVIEW

Preview - Bright Path Sped

My name _____ Date _____

Read the Data Table

Read the table. Fill in the boxes.

These temperatures are invented. The set point is 20 degrees. Change = the 10 minute number minus the 0 minute number. Use a minus sign when it goes down.

Room	0 min	2 min	4 min	6 min	8 min	10 min	Change
Room A	26	24	22	21	20	20	
Room B	26	28	31	34	38	41	
Room C	14	16	18	19	20	20	

Runs away from the set point: ☐ **Both come back to it:** ☐

At 10 minutes, how many degrees is Room B from the set point? ☐

Which room has a loop that is not working? How do you know?

What do the numbers in Room A tell you?

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Fix It 1

Is it true or false? Fix each false one.

Some of these are true. Some have a mistake. Rewrite each false one so it is true.

1. Homeostasis means keeping conditions inside the body steady. ☐ true ☐ false

   If false, fix it: _____

2. In negative feedback, the response makes the change bigger. ☐ true ☐ false

   If false, fix it: _____

3. The control center compares the level to the set point. ☐ true ☐ false

   If false, fix it: _____

4. A receptor is the part that carries out the response. ☐ true ☐ false

   If false, fix it: _____

5. Homeostasis means nothing in the body ever changes. ☐ true ☐ false

   If false, fix it: _____

PREVIEW

My name _____ Date _____

Claim, Evidence, Reasoning 2

Read the facts. Write your claim, evidence and reasoning.

After a meal (invented units) (invented numbers)

A model has a blood sugar set point of 90 units. Before a meal it is 90. After the meal it is 140. Two hours later it is 100. What does the data show about the loop?

Claim

Evidence: use the numbers

Reasoning: why does the evidence fit the claim?

A basket of fruit (invented numbers)

A basket has 2 ripe fruits on day 1, 5 ripe fruits on day 2 and 11 ripe fruits on day 3. Ripe fruit gives off a gas that helps other fruit ripen. Is this negative or positive feedback?

Claim

Evidence: use the numbers

Reasoning: why does the evidence fit the claim?

PREVIEW

Preview - Bright Path Sped

My name _____ Date _____

Short Answer

Answer each question in your own words.

Useful words **stimulus** **receptor** **control center** **effector** **set point** **reverse**

1. How is a thermostat like the control center in a body?

2. Describe what happens when a model body gets too warm. Use the words stimulus, receptor, control center, effector and response.

3. Why do scientists call a helpful loop negative feedback?

4. Give one example of positive feedback.

5. Why does a body need homeostasis?

PREVIEW

Preview - Bright Path Shed

My name _____ Date _____

Cut and Sort 2

Cut out the pieces. Paste each one in its box.

Which part of the loop is it? Paste two pieces in each box.

Receptor detects the change	**Control center** decides what to do	**Effector** carries out the response

PREVIEW

Cut on the dashed lines: one cut across and two down.

skin sensors	sweat glands	thermostat
heater	thermometer	brain

Answer Key: Name the Feedback and Sorts

Negative feedback reverses the change. Positive feedback makes the change bigger. In the sort keys, r1 c1 is the top left piece.

Name the Feedback 1 page 14

#	Item	Type	A good clue
1	Your body is too warm, so you sweat and cool down.	Negative feedback	the response reverses the change
2	A microphone picks up its own sound from a speaker, and the sound grows louder and louder.	Positive feedback	the change feeds itself
3	A thermostat turns the heater off when the room reaches the set point.	Negative feedback	the loop stops at the set point
4	A ripe fruit gives off a gas that makes nearby fruit ripen, and those fruits give off more.	Positive feedback	each step makes the change bigger
5	After a meal, blood sugar rises and the body moves sugar out of the blood.	Negative feedback	the amount is pushed back down
6	A snowball rolls downhill, picks up snow, gets bigger and rolls faster.	Positive feedback	bigger leads to even bigger
7	You shiver when you are too cold, and the shivering warms you.	Negative feedback	the response reverses the change
8	Too little water makes you thirsty, so you drink, and the water amount goes back up.	Negative feedback	the response fixes the change

Cut and Sort 1 page 27

Piece	Piece shows	Box
r1 c1	sweating on a hot day	Temperature
r1 c2	insulin lowers the amount in the blood	Sugar
r1 c3	feeling thirsty	Water
r2 c1	shivering on a cold day	Temperature
r2 c2	stored sugar is released between meals	Sugar
r2 c3	kidneys save water	Water

Name the Feedback 2 page 15

#	Item	Type	A good clue
1	The response reverses the change.	Negative feedback	reversing keeps things steady
2	The response makes the change bigger.	Positive feedback	adding to the change
3	It keeps a level near the set point.	Negative feedback	steady is the goal
4	Each turn of the loop moves the level farther from where it began.	Positive feedback	farther each time
5	It is a runaway: the change feeds itself.	Positive feedback	a runaway loop
6	A working thermostat is a model of this kind.	Negative feedback	it turns off at the set point
7	It speeds up until something stops it.	Positive feedback	nothing pulls it back
8	The level swings back toward the middle.	Negative feedback	back toward the set point

Cut and Sort 2 page 28

Piece	Piece shows	Box
r1 c1	skin sensors	Receptor
r1 c2	sweat glands	Effector
r1 c3	thermostat	Control center
r2 c1	heater	Effector
r2 c2	thermometer	Receptor
r2 c3	brain	Control center

PREVIEW

Answer Key: Fix It and Quiz

Accept a fixed sentence that says the same thing in a student's own words.

Fix It 1 page 21

#	Is it	Fixed sentence
1	true	-
2	false	In negative feedback, the response reverses the change.
3	true	-
4	false	An effector carries out the response. A receptor detects the change.
5	false	Conditions change all the time. Homeostasis brings them back toward the set point.

Fix It 2 page 22

#	Is it	Fixed sentence
1	true	-
2	false	Shivering makes heat, so it warms the body.
3	true	-
4	false	The words tell the direction, not good or bad. Negative feedback reverses a change and positive feedback adds to it.
5	false	A working thermostat turns the heater on when the room is too cold and off at the set point.

Quiz page 25

#	Answer
1	homeostasis
2	set point
3	receptor
4	control center
5	effector
6	negative feedback
7	positive feedback
8	control center
9	the pancreas
10	warm up

Where to go after the quiz

- Missed the part names: sort again on page 28 and fill in a loop on page 16.
- Missed the feedback items: reread page 11 and sort page 29.
- Missed the direction idea: practice page 12.

PREVIEW

Answer Key: Fill In the Loops

Bold words are what the student writes in the boxes. Every loop is simplified and invented for practice; the word bank on each page holds these words.

Fill In the Loop 1 page 16

Loop	Stimulus	Receptor	Control center	Effector	Response
A thermostat and a cold room	room gets too cold (printed)	thermometer	thermostat	heater	room warms up
The body gets too warm (a model)	body gets too warm (printed)	skin sensors	brain	sweat glands	sweating cools the body

Fill In the Loop 2 page 17

Loop	Stimulus	Receptor	Control center	Effector	Response
The body gets too cold (a model)	body gets too cold (printed)	skin sensors	brain	muscles	shivering makes heat (printed)
Blood sugar rises after a meal	blood sugar rises (printed)	sensors	pancreas	liver and muscle cells	sugar leaves the blood

Fill In the Loop 3 page 18

Loop	Stimulus	Receptor	Control center	Effector	Response
The body has too little water	too little water (printed)	brain sensors	brain	kidneys	less water leaves

Loop 3: tell the loop (sample)

The water in the body drops, so sensors in the brain notice. The brain, the control center, makes you thirsty and tells the kidneys to save water. Less water leaves in urine, and the amount of water goes back up.

Accept variations

Real body loops have more parts than these simplified ones. Accept any answer that puts a sensible part in each box, and ask the student to say how it fits: what detects, what decides, what acts.

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 _____

Page type	Covered since last note (Y/N)	Items right	Still blank
Words and readings			
Which way back and worked example			
Name the Feedback			
Fill in the loops			
Data, graph, Fix It and claims			
Sorts			

What I saw (observable, not a conclusion)

- Named negative or positive feedback correctly on ___ of ___ items without a prompt.
- Put the parts of a loop in order on ___ of ___ boxes.
- Used a number or a clue as evidence: yes / no / with a reminder.
- Used the reference page (page 5): 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

"Named the kind of feedback on 6 of 8 items on Name the Feedback 1 without a prompt on 11/6. Next step: ask whether the response reverses the change before choosing." That is the level of detail this page is built for. It matches the filled example on page 40.

PREVIEW

Jordan's Tracker (Invented Student)

Jordan P. is invented; nothing on this page describes a real student. The blank tracker is on page 36.

Student: Jordan P. (an invented student)

Teacher: Ms. Alvarez (invented)

Month: November

Page	Page type and set	Items	Right	Date	Notes
6	Homeostasis Words	6	5	11/3	Mixed up receptor and effector
7	Read: What Is Homeostasis?	5	5	11/4	-
8	Read: Body Temperature	5	-	-	-
9	Read: Blood Sugar	5	-	-	-
10	Read: Water Balance	5	-	-	-
11	Read: Negative and Positive Feedback	5	-	-	-
12	Which Way Back?	8	6	11/5	Said up when the level was above the set point
13	Worked Example	3	-	-	-
14	Name the Feedback 1	8	6	11/6	Called two negative examples positive
15	Name the Feedback 2	8	-	-	-
16	Fill In the Loop 1	8	6	11/10	Put the heater in the receptor box
17	Fill In the Loop 2	7	-	-	-
18	Fill In the Loop 3	4	-	-	-
19	Read the Data Table	6	-	-	-
20	Graph the Data	8	-	-	-
21	Fix It 1	5	-	-	-
22	Fix It 2	5	-	-	-
23	Claim, Evidence, Reasoning 1	6	-	-	-
24	Claim, Evidence, Reasoning 2	6	-	-	-
25	Quiz	10	-	-	-
26	Short Answer	5	-	-	-
27	Cut and Sort 1	6	5	11/12	One piece pasted in the wrong box
28	Cut and Sort 2	6	-	-	-
29	Cut and Sort 3	10	-	-	-

How to read it

Jordan P. has done **6 of 24** scored pages and got **33 of 41** items right with no prompt. **1** page was all right and **5** carry a note. Every number comes from the table.

What the table points to

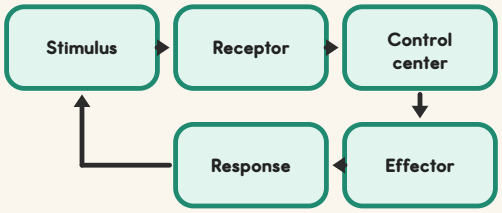
The lowest pages are Which Way Back? (6 of 8) and Name the Feedback 1 (6 of 8) and Fill In the Loop 1 (6 of 8). That is where the next practice goes. The 18 pages left blank are not tried yet, never wrong.

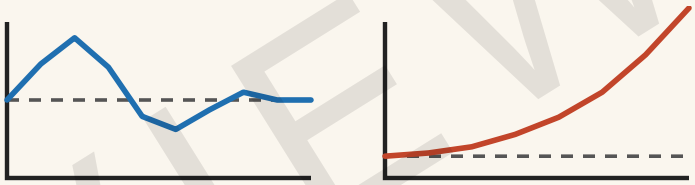
PREVIEW

Binder Cover

Slide this into the front of a binder. The divider tabs and a spine label to cut out are on the next page (page 43).

Science - Life Science





HOMEOSTASIS

Feedback Loops

Learn	Practice	Check

Teacher _____

Class or student _____

PREVIEW