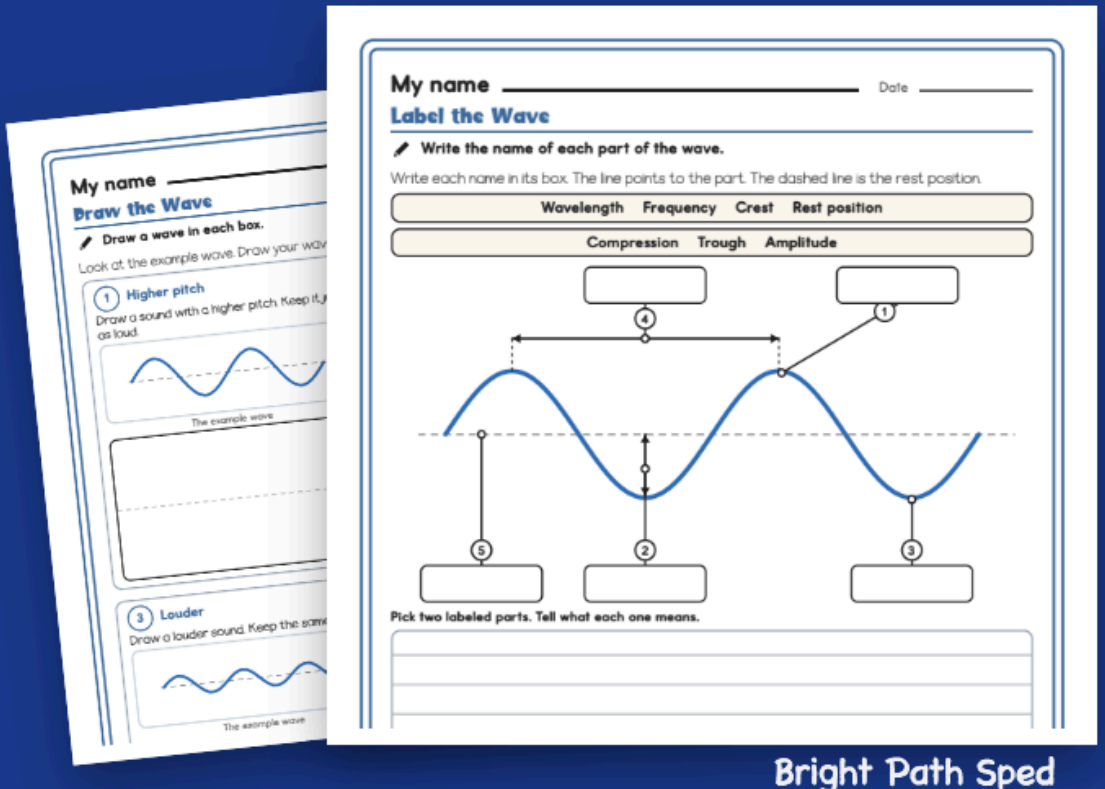
SOUND WAVES

WORKSHEETS
GRADES 6-8



25 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.

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. Every question is read, and a fix to the file ships as a free update: re-download it any time from My Purchases.

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PREVIEW

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 an example wave, with a dashed rest line. Draw your wave there; it is for pencil, not typing.
- **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 wave cards to look things up.
Words and matching	3 sheets, 22 items	Match words and clues.
Labels and drawing	3 sheets, 14 items	Label two diagrams, then draw waves for a new pitch or loudness.
Wave speed and media	3 sheets, 12 items	Try a worked example, solve six problems, say what carries the sound.
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	5 sheets, 18 pieces	Exit tickets, a self check, and three 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 30 to 34.

Short answers

Their keys (page 34) 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: What Is Sound?

Read about sound. Then answer.

It starts with a shake

Every sound begins with a **vibration**, a quick back-and-forth motion. When a guitar string is plucked, it vibrates and pushes on the air around it. The pushed air pushes the air next to it, and a **sound wave** spreads outward. A sound wave carries **energy** from one place to another. The air itself does not travel with the wave. Its particles only move back and forth a short way. Sound is a **longitudinal wave**: the particles move back and forth in the same direction the wave travels. Where the particles are squeezed together, the wave has a **compression**. Where they are spread apart, it has a **rarefaction**.

Main idea: What is this reading mostly about?

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

1. What starts every sound?
   - **A** A flash of light
   - **B** A vibration
   - **C** A change in color

   ☐

2. What does a sound wave carry from place to place?
   - **A** Energy
   - **B** All of the air particles
   - **C** Light

   ☐

3. What is a compression?
   - **A** A part of the wave where the particles are spread apart
   - **B** The highest point of a wave
   - **C** A part of the wave where the particles are squeezed together

   ☐

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Reading 3: Pitch and Loudness

Read about pitch and loudness. Then answer.

High or low, loud or soft

Frequency is the number of waves that pass a point each second. It is measured in **hertz (Hz)**. A sound with a higher frequency has a higher **pitch**, and a lower frequency means a lower pitch. People can usually hear sounds from about 20 Hz to 20,000 Hz. **Amplitude** is how far a wave rises from its rest position. A larger amplitude carries more energy, and the sound is louder. Loudness is measured in **decibels (dB)**. Pitch and loudness are separate: a sound can be high and soft, or low and loud. The **wavelength** is the distance from one crest to the next. In the same material, a higher frequency gives a shorter wavelength.

Main idea: What is this reading mostly about?

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

1. What does a higher frequency give a sound?
   - **A** A higher pitch
   - **B** A louder sound
   - **C** A longer wavelength

2. What makes a sound louder?
   - **A** A smaller amplitude
   - **B** A larger amplitude
   - **C** A lower frequency

3. Which unit measures frequency?
   - **A** Decibels (dB)
   - **B** Meters per second
   - **C** Hertz (Hz)

PREVIEW

My name _____ Date _____

Worked Example: Wave Speed

Read the example. Then try one.

How to find the speed of a wave

Frequency is in hertz (Hz), wavelength is in meters (m), and speed is in meters each second (m/s). The six wave cards are on page 10.

Example. The numbers are made up for practice.

Start	Read the problem. A sound wave has a frequency of 50 Hz and a wavelength of 4 m. How fast does it travel?
Step 1	Write the formula. speed = frequency x wavelength
Step 2	Put in the numbers. speed = 50 x 4
Step 3	Multiply. 200
Check	Write the unit. 200 m/s

Your turn. Do the same steps.

Start	A sound wave has a frequency of 20 Hz and a wavelength of 5 m. How fast does it travel?
Step 1	Write the formula.
Step 2	Put in the numbers.
Step 3	Multiply. Write the answer.
Check	Write the speed with its unit.

PREVIEW

Preview · Bright Path Sped

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 wave cards to help you.

1	**Vibration**		A	The distance from one crest to the next crest.
2	**Medium**		B	A space with no matter in it, so sound cannot travel.
3	**Vacuum**		C	A part of a sound wave where the particles are squeezed together.
4	**Frequency**		D	A quick back-and-forth motion that makes sound.
5	**Amplitude**		E	The number of waves that pass a point each second.
6	**Wavelength**		F	How high or low a sound seems.
7	**Pitch**		G	The material a sound wave travels through.
8	**Compression**		H	How far a wave rises from its rest position.

Pick one word. Use it in a sentence about sound.

PREVIEW

My name _____ Date _____

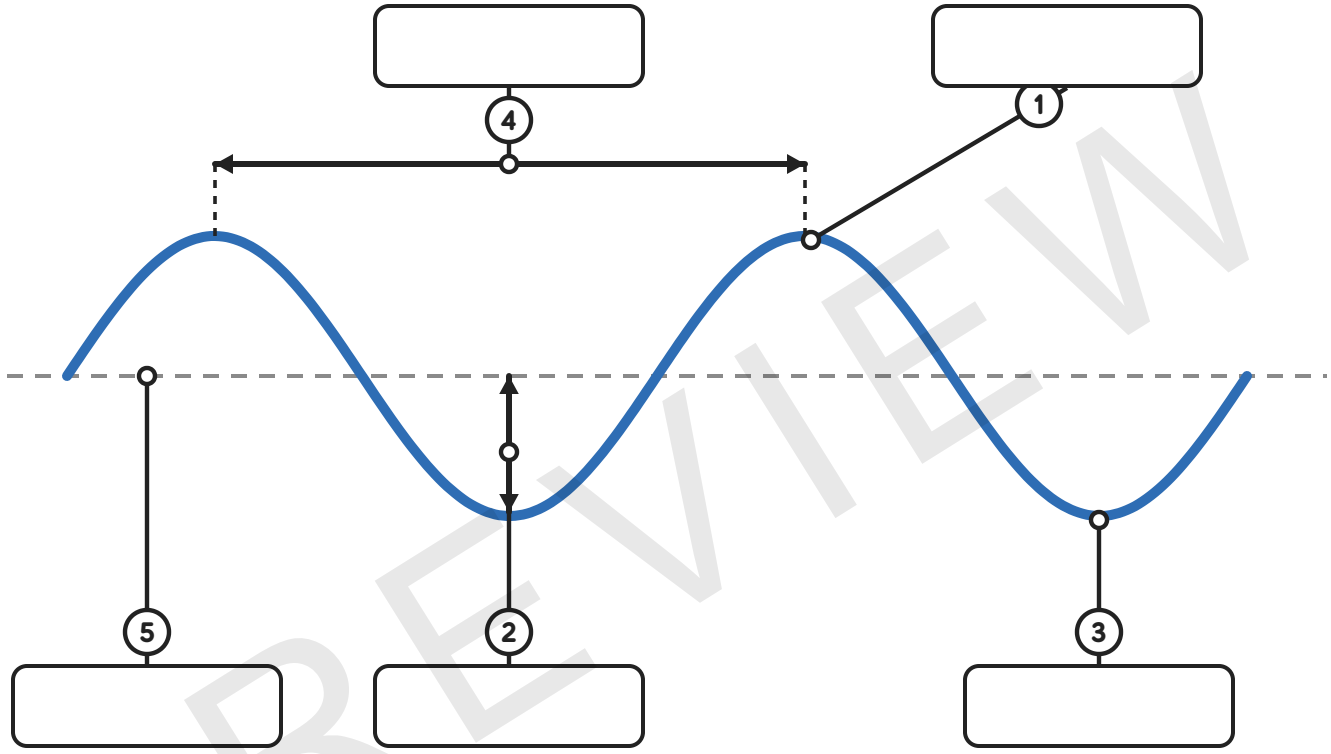
Label the Wave

Write the name of each part of the wave.

Write each name in its box. The line points to the part. The dashed line is the rest position.

Wavelength **Frequency** **Crest** **Rest position**

Compression **Trough** **Amplitude**



Pick two labeled parts. Tell what each one means.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

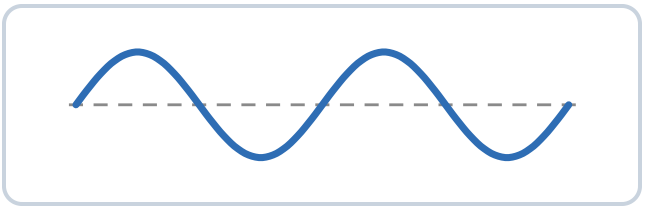
Draw the Wave

Draw a wave in each box.

Look at the example wave. Draw your wave in the box under it. The dashed line is the rest line.

1 Higher pitch

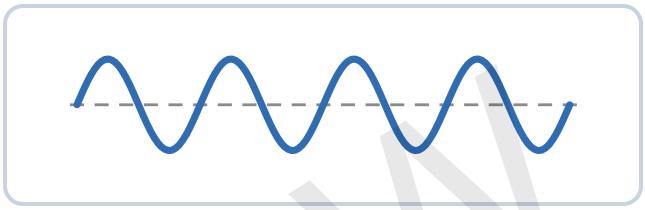
Draw a sound with a higher pitch. Keep it just as loud.



The example wave

2 Lower pitch

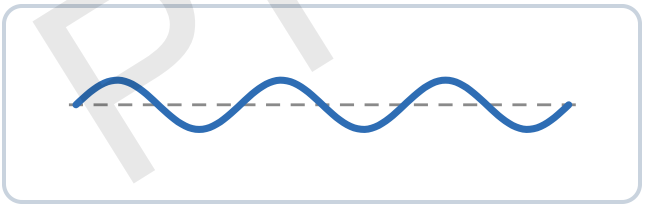
Draw a sound with a lower pitch. Keep it just as loud.



The example wave

3 Louder

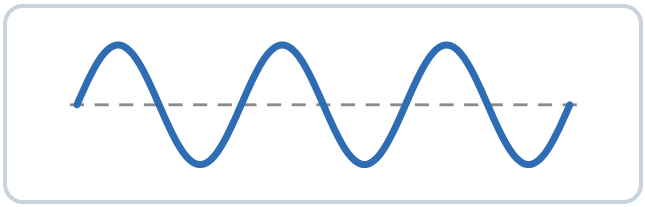
Draw a louder sound. Keep the same pitch.



The example wave

4 Softer

Draw a softer sound. Keep the same pitch.



The example wave

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

True or False 1

Is it true or false? Check one.

Check true or false for each sentence.

1. Sound is made by vibrations. ☐ true ☐ false

2. Sound waves can travel through a vacuum. ☐ true ☐ false

3. A sound wave carries energy from one place to another. ☐ true ☐ false

4. A higher frequency means a lower pitch. ☐ true ☐ false

5. Amplitude tells how far a wave rises from its rest position. ☐ true ☐ false

6. Sound usually travels fastest through gases. ☐ true ☐ false

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

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Quiz A

Pick the best answer. Write its letter.

Take your time. Guess if you are not sure.

1. Which unit measures frequency?
   - **A** Hertz (Hz)
   - **B** Decibels (dB)
   - **C** Meters (m)

2. Which part of a wave is the highest point?
   - **A** The trough
   - **B** The crest
   - **C** The rest position

3. Which wave property changes the pitch of a sound?
   - **A** Amplitude
   - **B** The medium
   - **C** Frequency

4. Which wave property changes the loudness of a sound?
   - **A** Amplitude
   - **B** Frequency
   - **C** The medium

5. What must a sound wave travel through?
   - **A** A vacuum
   - **B** A medium
   - **C** A beam of light

6. In a sound wave, what is a rarefaction?
   - **A** A part where the particles are spread apart
   - **B** A part where the particles are squeezed together
   - **C** The highest point of the wave

PREVIEW

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:**

"Sound can travel through a vacuum."

What is wrong?

Write it the right way.

2 **Sam wrote:**

"A higher frequency makes a sound louder."

What is wrong?

Write it the right way.

3 **Sam wrote:**

"Wavelength is the height of a wave."

What is wrong?

Write it the right way.

4 **Sam wrote:**

"Sound travels fastest through air."

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 Wave X and wave Y have the same amplitude, but wave X has more waves each second. Compare their pitch and their loudness.

5 A bell rings inside a sealed jar. A pump slowly takes the air out. What happens to the sound you hear, and why?

6 Tell where a compression and a rarefaction are in a sound wave. How far apart are two compressions?

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Check My Own Work

Check your own work. Mark yes or not yet.

1	I can explain how a vibration makes a sound wave.	☐ yes	☐ not yet
2	I can say why sound needs a medium.	☐ yes	☐ not yet
3	I can say what a vacuum is.	☐ yes	☐ not yet
4	I can label a crest, a trough, a wavelength and an amplitude.	☐ yes	☐ not yet
5	I can tell frequency from amplitude.	☐ yes	☐ not yet
6	I can say how frequency changes pitch.	☐ yes	☐ not yet
7	I can say how amplitude changes loudness.	☐ yes	☐ not yet
8	I can use speed = frequency x wavelength.	☐ yes	☐ not yet

The idea I can explain best is...

The part I still need help with is...

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Cut and Paste 3: Pitch Pictures

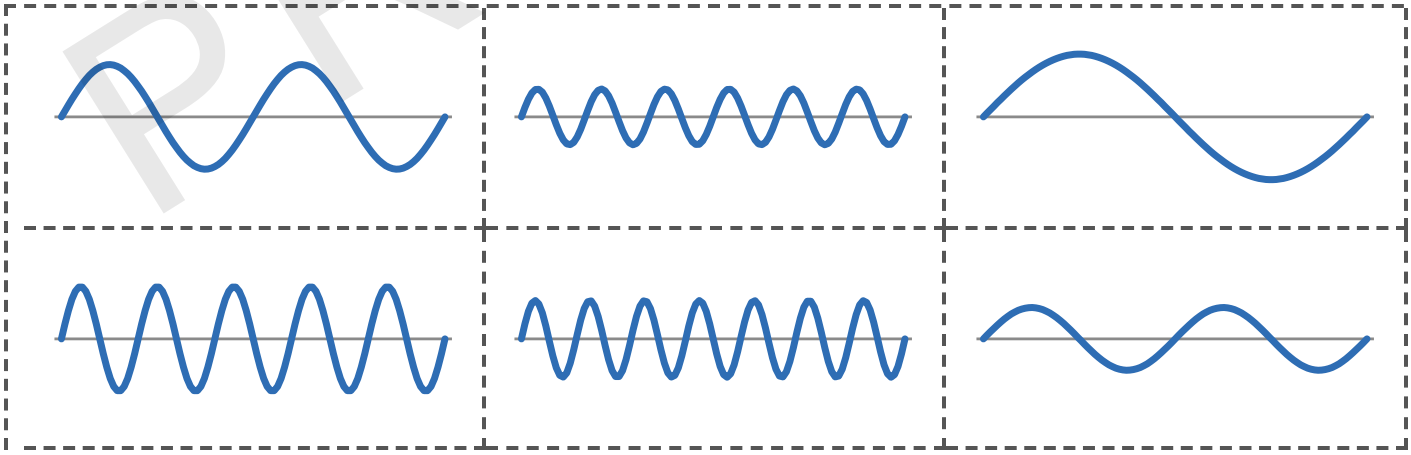
Cut out the six pieces. Paste each one in the right box.

Count the waves in each piece. The pieces are all the same size.

Higher pitch: more waves	Lower pitch: fewer waves

PREVIEW

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



How did you tell a high pitch from a low pitch?

Answer Key: Labels, Drawing, Worked Example

Box numbers match the numbers on the diagrams.

Label the Wave page 13

Box	Name	Where it is
1	Crest	The highest point of the wave (the arrow points to the second crest)
2	Amplitude	The distance from the rest position to a crest or to a trough (the double arrow)
3	Trough	The lowest point of the wave (the second trough)
4	Wavelength	The distance from one crest to the next crest (the bracket)
5	Rest position	The dashed line where the wave would be with no vibration

Label the Sound Wave page 14

Box	Name	Where it is
1	Compression	A dense band where the particles are squeezed together (shaded)
2	Wavelength	The distance from one compression to the next (the bracket)
3	Rarefaction	A sparse band where the particles are spread apart
4	Wave direction	The arrow below the particles: the way the wave travels, away from the speaker
5	Vibrating source	The speaker, which vibrates and starts the wave

Draw the Wave page 15

Item	What the drawing needs
15.1: Higher pitch	More waves in the same space (for example four waves), drawn at the same height as the example.
15.2: Lower pitch	Fewer waves in the same space (for example two waves), drawn at the same height as the example.
15.3: Louder	Taller waves, with the same number of waves as the example.
15.4: Softer	Shorter waves, with the same number of waves as the example.

Worked Example: your turn page 9

Step	Answer
Step 1: the formula	speed = frequency x wavelength
Step 2: the numbers	speed = 20 x 5
Step 3: multiply	100
Check: speed with unit	100 m/s

Reading a wave picture

- More waves in the same space means a higher frequency and a higher pitch.
- Taller waves mean a larger amplitude and a louder sound.
- Accept any drawing that follows the rule; the waves do not have to be perfect.

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	Hertz (Hz)
20.2	B	The crest
20.3	C	Frequency
20.4	A	Amplitude
20.5	B	A medium
20.6	A	A part where the particles are spread apart
21.1	B	A solid
21.2	A	A sound that bounces off a surface and comes back
21.3	A	10 Hz
21.4	A	A loud shout
21.5	A	The one with more waves each second
21.6	C	The particles move back and forth in the direction the wave travels

Find the Mistake page 22

Item	What went wrong	Right sentence
22.1	Sound needs a medium. A vacuum has no matter, so there is nothing to carry the wave.	Sound cannot travel through a vacuum because it needs a medium.
22.2	Frequency changes the pitch, not the loudness. Amplitude changes the loudness.	A higher frequency makes a higher pitch. A larger amplitude makes a louder sound.
22.3	Wavelength is a distance along the wave, from one crest to the next. Height is amplitude.	Wavelength is the distance from one crest to the next crest.
22.4	Sound is usually slower in air than in liquids and solids.	Sound usually travels fastest through solids and slowest through gases.

PREVIEW

Sound Waves Tracker

One student, every scored sheet. Filled example: page 39.

Student _____ Teacher _____ Month _____

Page	Page type and set	Items	Right	Date	Notes
5	Reading 1: What Is Sound?	3			
6	Reading 2: How Sound Travels	3			
7	Reading 3: Pitch and Loudness	3			
8	Sound Words	6			
11	Match Word to Meaning	8			
12	Who Am I?	8			
13	Label the Wave	5			
14	Label the Sound Wave	5			
15	Draw the Wave	4			
16	Wave Speed Practice	6			
17	What Carries the Sound?	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: Pitch or Loudness	6			
28	Cut and Paste 2: Solid, Liquid or Gas	6			
29	Cut and Paste 3: Pitch Pictures	6			

PREVIEW

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 103 items on the 19 scored sheets. Answer keys: pages 30 to 34. Filled example: page 39.

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

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 drawing			
Wave speed			
True or false			
Quizzes			
Mistakes			
Sorts			

What I saw (observable, not a conclusion)

- Matched ___ of 16 items (pages 11, 12).
- Labeled ___ of 10 parts (pages 13, 14) and solved ___ of 6 wave speed problems (page 16).
- Got ___ of 12 true or false sentences right (pages 18, 19).
- Explained one idea 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 10/17. Next step: reread Reading 3 and ask which wave property changes the pitch." That is the level of detail this page is built for. It matches the filled example on page 39.

PREVIEW

Eli's Tracker (Invented Student)

Eli T. is invented; nothing on this page describes a real student. The blank tracker is on page 35.

Student: Eli T. (an invented student)

Teacher: Ms. Park (invented)

Month: October

Page	Page type and set	Items	Right	Date	Notes
5	Reading 1: What Is Sound?	3	3	10/6	-
6	Reading 2: How Sound Travels	3	2	10/7	Thought sound can travel in a vacuum
7	Reading 3: Pitch and Loudness	3	-	-	-
8	Sound Words	6	5	10/8	Mixed up hertz and decibel
11	Match Word to Meaning	8	6	10/9	Swapped pitch and frequency
12	Who Am I?	8	-	-	-
13	Label the Wave	5	3	10/13	Swapped crest and trough, missed the rest position
14	Label the Sound Wave	5	4	10/14	Missed the wave direction
15	Draw the Wave	4	-	-	-
16	Wave Speed Practice	6	4	10/16	Forgot to divide to find the wavelength
17	What Carries the Sound?	6	-	-	-
18	True or False 1	6	4	10/17	Thought a higher frequency means a lower pitch
19	True or False 2	6	-	-	-
20	Quiz A	6	5	10/20	Mixed up frequency and amplitude
21	Quiz B	6	-	-	-
22	Find the Mistake	4	-	-	-
27	Cut and Paste 1: Pitch or Loudness	6	6	10/22	-
28	Cut and Paste 2: Solid, Liquid or Gas	6	-	-	-
29	Cut and Paste 3: Pitch Pictures	6	-	-	-

How to read it

Eli T. has done **10 of 19** scored sheets and got **42 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 sheet is Label the Wave (3 of 5). That is where the next practice goes. The 9 sheets left blank are not tried yet, never wrong.

PREVIEW