SPEED, VELOCITY AND ACCELERATION

WORKSHEETS GRADES 6-8



26 STUDENT PAGES


My name

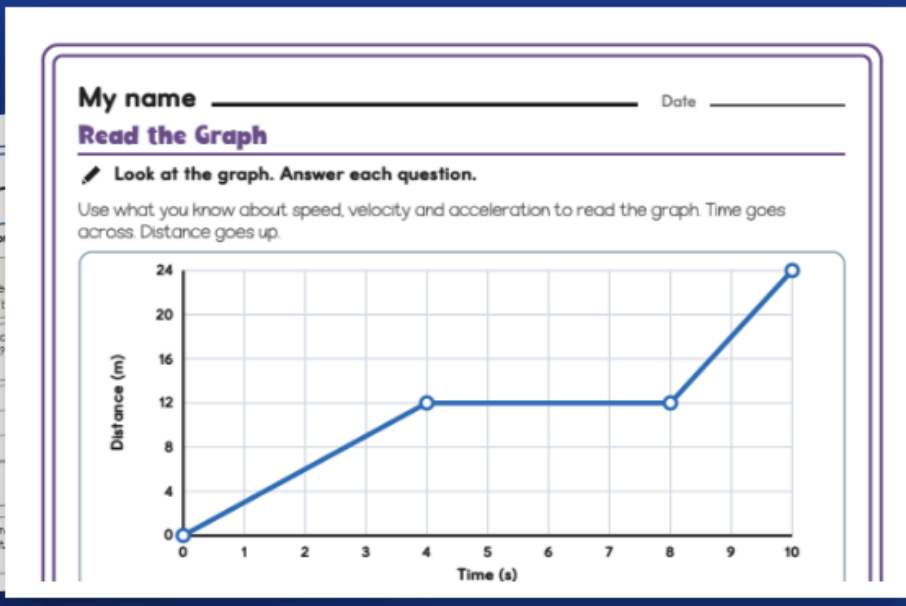
Acceleration Practice

Solve each problem. Show your work

Remember

Show your work

Answer m/s^2


My name _____ Date _____

Read the Graph

Look at the graph. Answer each question.

Use what you know about speed, velocity and acceleration to read the graph. Time goes across. Distance goes up.

Distance (m)

Time (s)

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 work and sentences. Write one step to a line.
- **The check box.** True or false, yes or not yet: click or mark.
- **The graph grid.** The plot page has an empty grid for pencil: mark each point, then draw the line with a ruler.
- **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
Notes and cards	5 sheets	Fill the guided notes, study three worked examples, keep the cards.
Words and matching	2 sheets, 14 items	Match words and formulas.
Formula practice	3 sheets, 18 items	Speed, velocity and acceleration problems with room to work.
Graphs	3 sheets, 15 items	Read one graph, compare two lines, plot a graph from a table.
Word problems	2 sheets, 12 items	Pick the formula, solve, and write the unit.
Checks	5 sheets, 28 items	True or false, two quizzes, and Sam's mistakes.
Writing, self check, sorts	6 sheets, 18 pieces	Short answers, exit tickets, a self check, three sorts.

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 31 to 36.

Short answers

Their keys (page 36) say what to look for, not one right sentence. Accept any answer that uses a fact from 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 two to four lines. If a student needs more room, let them write on scrap paper and copy the answer into the box.

PREVIEW

My name _____ Date _____

Guided Notes

Fill in each blank. Use the word bank.

Fill in each blank. Use the word bank. Two words are not used.

time	fast	directions	second	Acceleration
mass	slowing	Velocity	starting	weight

1. Speed tells how _____ an object moves.
2. To find speed, divide the distance by the _____.
3. Speed is measured in meters each _____, written m/s.
4. _____ is speed with a direction, like 5 m/s north.
5. Two objects can have the same speed but different velocities if they move in different _____.
6. _____ is how fast the velocity changes.
7. Acceleration = (final speed - _____ speed) / time.
8. A negative acceleration means the object is _____ down.

Write your own example of a velocity.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Worked Example: Velocity

Read the example. Then try one.

Velocity

Velocity is speed with a direction. The number is found the same way. Then write the direction after the unit.

Example. The numbers are made up for practice.

Start
Read the problem.
A cyclist rides 60 m north in 12 s. What is her velocity?

Step 1
Write the formula.
velocity = distance / time, with the direction

Step 2
Put in the numbers.
velocity = 60 m / 12 s

Step 3
Divide.
60 / 12 = 5

Check
Write the unit and direction.
5 m/s north

Your turn. Do the same steps.

Start
A cyclist rides 84 m east in 12 s. What is her velocity?

Step 1
Write the formula.

Step 2
Put in the numbers.

Step 3
Divide.

Check
Write the unit and direction.

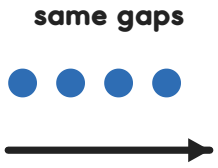
PREVIEW

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My name _____ Date _____

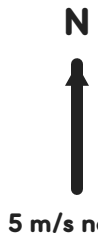
Six Formula Cards

Read the six cards. Keep them all week.



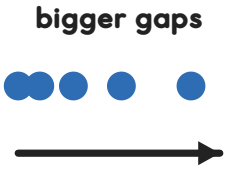
Speed

How fast an object moves. Speed = distance / time. Example: 120 m in 30 s is 4 m/s.



Velocity

Speed with a direction, like 5 m/s north. Same speed but a different direction is a different velocity.



Acceleration

How fast the velocity changes. Acceleration = (final speed - starting speed) / time.



Distance-Time Graph

Time goes across and distance goes up. A steeper line is a faster speed. A flat line means not moving.

m/s

m/s²

Units

Distance in meters (m). Time in seconds (s). Speed and velocity in m/s. Acceleration in m/s^2.



Slowing Down

If the final speed is less than the starting speed, the acceleration is a negative number. The object is slowing down.

Pick one card. Tell what it means in your own words.

PREVIEW

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My name _____ Date _____

Speed Practice

Solve each problem. Show your work.

Remember

speed = distance / time. To find the distance, multiply speed x time. To find the time, divide the distance by the speed.

1 A runner goes 150 m in 25 s. What is her speed?

Show your work

Answer _____ **m/s**

2 A runner goes 96 m in 12 s. What is her speed?

Show your work

Answer _____ **m/s**

3 A cart moves at 5 m/s for 14 s. How far does it go?

Show your work

Answer _____ **m**

4 A cart moves at 12 m/s for 9 s. How far does it go?

Show your work

Answer _____ **m**

5 A bike must go 200 m at 8 m/s. How long does it take?

Show your work

Answer _____ **s**

6 A bike must go 162 m at 9 m/s. How long does it take?

Show your work

Answer _____ **s**

PREVIEW

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My name _____ Date _____

Acceleration Practice

Solve each problem. Show your work.

Remember

acceleration = (final speed - starting speed) / time. A negative answer means slowing down. To find the time, divide the change in speed by the acceleration.

1 A scooter speeds up from 0 m/s to 18 m/s in 6 s. What is its acceleration?

Show your work

Answer _____ m/s^2

2 A scooter speeds up from 4 m/s to 24 m/s in 5 s. What is its acceleration?

Show your work

Answer _____ m/s^2

3 A scooter speeds up from 10 m/s to 40 m/s in 6 s. What is its acceleration?

Show your work

Answer _____ m/s^2

4 A scooter slows down from 30 m/s to 12 m/s in 6 s. What is its acceleration?

Show your work

Answer _____ m/s^2

5 A scooter slows down from 20 m/s to 0 m/s in 4 s. What is its acceleration?

Show your work

Answer _____ m/s^2

6 A sled has an acceleration of 4 m/s^2 and goes from 6 m/s to 30 m/s. How long does it take?

Show your work

Answer _____ s

PREVIEW

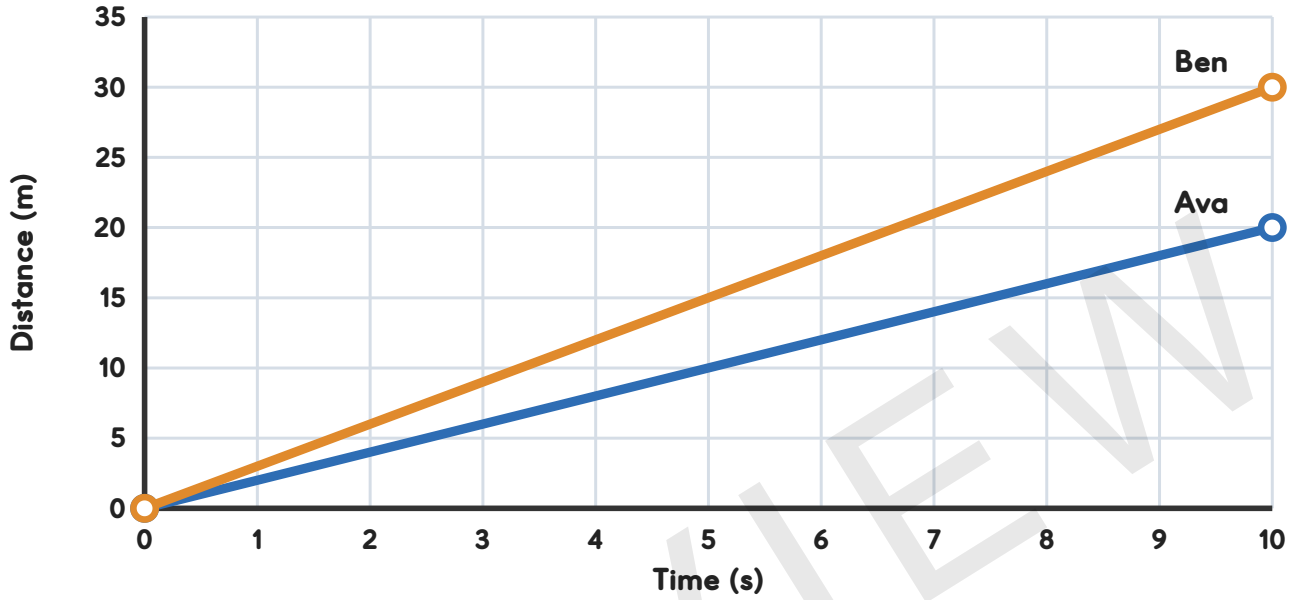
Preview · Bright Path Sped

My name _____ Date _____

Compare Two Graphs

Look at the two lines. Answer each question.

Ava and Ben start at the same place. Each dot is a place where the line was read.



1. Who is faster, Ava or Ben? ____

2. What is Ava's speed? ____ m/s

3. What is Ben's speed? ____ m/s

4. How far has Ava gone at 6 s? ____ m

5. How far has Ben gone at 6 s? ____ m

6. How much farther ahead is Ben at 10 s? ____ m

How can you tell who is faster just by looking at the lines?

PREVIEW

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My name _____ Date _____

Word Problems 1

Read the problem. Solve it.

Remember

speed = distance / time. Velocity is speed with a direction. acceleration = (final speed - starting speed) / time. Pick the formula that fits the question.

1 A scooter rider goes 60 m in 15 s. What is her average speed?

Show your work

Answer _____ **m/s**

2 A toy train moves at 3 m/s for 40 s. How far does it go?

Show your work

Answer _____ **m**

3 A swimmer crosses a 50 m pool in 25 s. What is her speed?

Show your work

Answer _____ **m/s**

4 A drone flies 360 m at 12 m/s. How long does the flight take?

Show your work

Answer _____ **s**

5 A ball rolls 24 m east in 8 s. What is its velocity?

Show your work

Answer _____ **m/s Direction** _____

6 A bike speeds up from 2 m/s to 14 m/s in 4 s. What is its acceleration?

Show your work

Answer _____ **m/s^2**

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. On a distance-time graph, a flat line means the object is not moving. ☐ true ☐ false

8. A steeper line on a distance-time graph means a slower speed. ☐ true ☐ false

9. Two cars with the same speed can have different velocities. ☐ true ☐ false

10. Acceleration is measured in m/s. ☐ true ☐ false

11. A negative acceleration can mean an object is slowing down. ☐ true ☐ false

12. To find distance, divide the speed by the time. ☐ true ☐ false

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

PREVIEW

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My name _____ Date _____

Quiz B

Pick the best answer. Write its letter.

Take your time. Guess if you are not sure.

7 A steeper line on a distance-time graph means...

A a slower speed
B no motion
C a faster speed

8 Two cars each go 20 m/s. One goes north and one goes south. Which is true?

A Same speed, different velocity
B Same speed, same velocity
C Different speed, same velocity

9 A bike slows from 10 m/s to 4 m/s in 3 s. What is its acceleration?

A 2 m/s^2
B -2 m/s^2
C 9 m/s^2

10 How far does a runner at 6 m/s go in 8 s?

A 2 m
B 48 m
C 14 m

11 Which one is NOT an acceleration?

A Moving in a straight line at a steady 20 m/s
B Speeding up
C Slowing down

12 How long does it take to go 90 m at 6 m/s?

A 540 s
B 84 s
C 15 s

PREVIEW

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My name _____ Date _____

Short Answers

Answer each question in sentences.

Use facts from the cards. Write in sentences.

1. Tell the difference between speed and velocity. Give an example of each.

2. A car goes around a curve at a steady 20 m/s. Is it accelerating? Explain.

3. Two lines on a distance-time graph start at the same place. One is steeper. Which object is faster, and how do you know?

PREVIEW

My name _____ Date _____

Cut and Paste 1: Speed, Velocity or Acceleration

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

Read each piece. Is it a speed, a velocity or an acceleration?

Speed	Velocity	Acceleration

PREVIEW

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

A plane flies 200 m/s west	A car goes from 0 to 20 m/s in 5 s	A cyclist rides at 8 m/s
A bike slows from 9 m/s to 3 m/s	A turtle crawls 3 m in 10 s	A ball rolls 4 m/s north

Which piece was hardest to place? Why?

My name _____ Date _____

Cut and Paste 3: Graph Lines

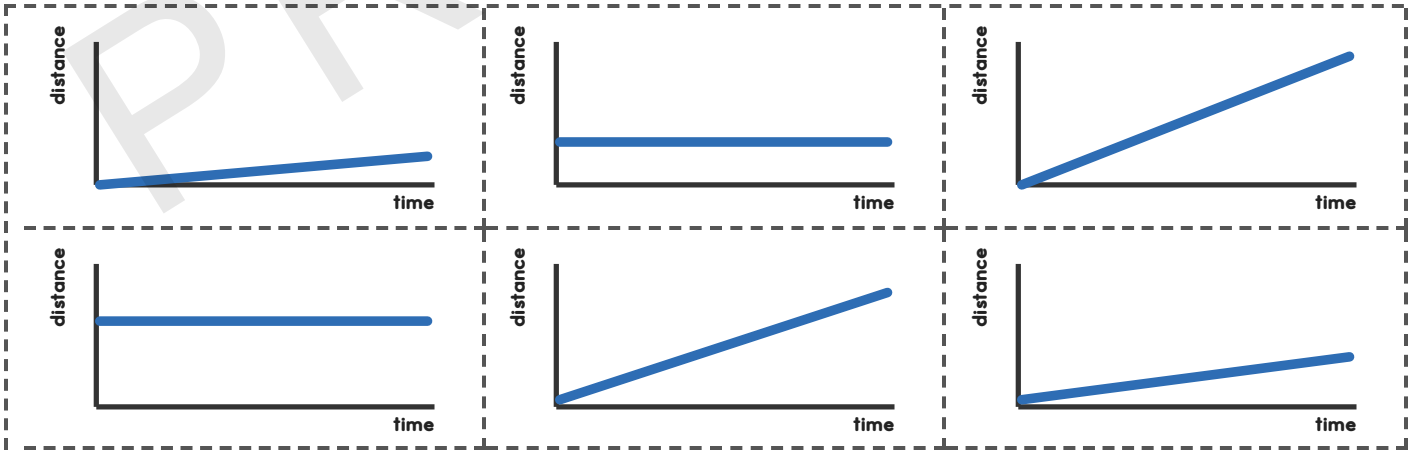
Cut out the six pieces. Paste each one in the right box.

Look at each line. Steep is fast. A shallow line is slow. A flat line is not moving.

Fast	Slow	Not moving

PREVIEW

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



How did you tell a fast line from a slow line?

Answer Key: Worked Examples, Formula Practice

Division is shown with a slash. A negative acceleration means the object is slowing down.

Worked Examples: your turn pages 6, 7, 8

Page	Topic	Steps 1 to 3 and the check
6	Speed	speed = distance / time; speed = 90 m / 15 s; 90 / 15 = 6; **6 m/s**
7	Velocity	velocity = distance / time, with the direction; velocity = 84 m / 12 s; 84 / 12 = 7; **7 m/s east**
8	Acceleration	acceleration = (final speed - starting speed) / time; acceleration = (28 - 4) / 6; 28 - 4 = 24, then 24 / 6 = 4; **4 m/s^2**

Speed Practice page 12

Item	Work	Answer
12.1	150 / 25 = 6	6 m/s
12.2	96 / 12 = 8	8 m/s
12.3	5 x 14 = 70	70 m
12.4	12 x 9 = 108	108 m
12.5	200 / 8 = 25	25 s
12.6	162 / 9 = 18	18 s

Velocity Practice page 13

Item	Work	Answer
13.1	48 / 8 = 6	6 m/s north
13.2	90 / 18 = 5	5 m/s east
13.3	135 / 15 = 9	9 m/s south
13.4	72 / 9 = 8	8 m/s west
13.5	4 x 12 = 48	48 m east
13.6	7 x 6 = 42	42 m west

Acceleration Practice page 14

Item	Work	Answer
14.1	(18 - 0) / 6 = 3	3 m/s^2
14.2	(24 - 4) / 5 = 4	4 m/s^2
14.3	(40 - 10) / 6 = 5	5 m/s^2
14.4	(12 - 30) / 6 = -3	-3 m/s^2
14.5	(0 - 20) / 4 = -5	-5 m/s^2
14.6	(30 - 6) / 4 = 6	6 s

PREVIEW

Answer Key: Word Problems

Every answer is computed from the numbers in the problem. Units are m, s, m/s or m/s^2.

Word Problems 1 page 18

Item	Formula	Work	Answer
18.1	speed = distance / time	60 / 15 = 4	4 m/s
18.2	distance = speed x time	3 x 40 = 120	120 m
18.3	speed = distance / time	50 / 25 = 2	2 m/s
18.4	time = distance / speed	360 / 12 = 30	30 s
18.5	velocity = distance / time, plus direction	24 / 8 = 3	3 m/s east
18.6	acceleration = (final - start) / time	(14 - 2) / 4 = 3	3 m/s^2

Word Problems 2 page 19

Item	Formula	Work	Answer
19.1	acceleration = (final - start) / time	(5 - 25) / 5 = -4	-4 m/s^2
19.2	average speed = total distance / total time	(80 + 120) / (20 + 20) = 5	5 m/s
19.3	acceleration = (final - start) / time	(60 - 0) / 10 = 6	6 m/s^2
19.4	distance = velocity x time, plus direction	9 x 7 = 63	63 m south
19.5	distance = speed x time (rest adds 0)	6 x 30 = 180 (resting adds 0 m)	180 m
19.6	speed = distance / time, compare	60 / 10 = 6 and 91 / 13 = 7	7 m/s

Reading a word problem

- Underline what the problem asks for: a speed, a distance, a time, a velocity or an acceleration.
- Pick the formula that has that answer on the left, then put in the numbers from the problem.
- Write the unit with the answer: m, s, m/s or m/s^2. Add the direction for a velocity.

Common slips to watch for

- Dividing time by distance instead of distance by time.
- Forgetting to subtract the starting speed when finding acceleration.
- Counting a rest as moving time, or leaving it out of the total time.

PREVIEW

Speed, Velocity and Acceleration Tracker

One student, every scored sheet. Filled example: page 41.

Student _____ Teacher _____ Month _____

Page	Page type and set	Items	Right	Date	Notes
5	Guided Notes	8			
10	Motion Words	6			
11	Match Formula to Job	8			
12	Speed Practice	6			
13	Velocity Practice	6			
14	Acceleration Practice	6			
15	Read the Graph	6			
16	Compare Two Graphs	6			
17	Plot Your Own Graph	3			
18	Word Problems 1	6			
19	Word Problems 2	6			
20	True or False 1	6			
21	True or False 2	6			
22	Quiz A	6			
23	Quiz B	6			
24	Find the Mistake	4			
28	Cut and Paste 1: Speed, Velocity or Acceleration	6			
29	Cut and Paste 2: Speeding Up or Slowing Down	6			
30	Cut and Paste 3: Graph Lines	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 113 items on the 19 scored sheets. Answer keys: pages 31 to 36. Filled example: page 41.

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
Notes and words			
Formula practice			
Graphs			
Word problems			
True or false			
Quizzes			
Mistakes			
Sorts			

What I saw (observable, not a conclusion)

- Solved ___ of 18 formula problems (pages 12 to 14).
- Answered ___ of 15 graph questions (pages 15 to 17) and ___ of 12 word problems.
- Got ___ of 12 true or false sentences right (pages 20, 21).
- 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 10/20. Next step: reread the velocity card and ask what a direction adds to a speed." That is the level of detail this page is built for. It matches the filled example on page 41.

PREVIEW

Eli's Tracker (Invented Student)

Eli T. is invented; nothing on this page describes a real student. The blank tracker is on page 37.

Student	Teacher	Month
Eli T. (an invented student)	Ms. Park (invented)	October

Page	Page type and set	Items	Right	Date	Notes
5	Guided Notes	8	7	10/6	Missed the word for a negative acceleration
10	Motion Words	6	5	10/7	Mixed up speed and velocity
11	Match Formula to Job	8	6	10/8	Swapped the two units
12	Speed Practice	6	4	10/10	Multiplied when the problem asked for the time
13	Velocity Practice	6	-	-	-
14	Acceleration Practice	6	3	10/14	Forgot to subtract the starting speed
15	Read the Graph	6	5	10/16	Read a flat part as a slow part
16	Compare Two Graphs	6	6	10/17	-
17	Plot Your Own Graph	3	-	-	-
18	Word Problems 1	6	-	-	-
19	Word Problems 2	6	-	-	-
20	True or False 1	6	4	10/20	Thought speed and velocity mean the same thing
21	True or False 2	6	-	-	-
22	Quiz A	6	5	10/21	Mixed up the units
23	Quiz B	6	-	-	-
24	Find the Mistake	4	-	-	-
28	Cut and Paste 1: Speed, Velocity or Acceleration	6	6	10/23	-
29	Cut and Paste 2: Speeding Up or Slowing Down	6	-	-	-
30	Cut and Paste 3: Graph Lines	6	-	-	-

How to read it

Eli T. has done **10 of 19** scored sheets and got **51 of 64** 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 Acceleration Practice (3 of 6). That is where the next practice goes. The 9 sheets left blank are not tried yet, never wrong.

PREVIEW