LESSON MAKER PRO

Start, Change, Story

Turn linear rules and patterns into real situations.

GRADE 8 · 8.PFA.3.f

8.PFA.3.f "Create a context for a linear function given a graph, table, or equation in the form y = mx + b."

NAME _____ DATE _____

BUILD A LINEAR STORY

In y = mx + b, b is the starting amount when x is 0. The number m tells how much y changes for each increase of 1 in x. Choose quantities that make the starting amount and rate make sense.

WORKED EXAMPLE

Create a context for y = 7x + 9.

1. Let x be the number of weeks and y be the total number of points.
2. The 9 means there are 9 points at the start.
3. The 7 means 7 points are added each week.
4. Write a story that includes both the start and the weekly change.

Answer: A reading challenge begins with 9 points. A student earns 7 more points each week, so after x weeks, the student has y points.

PRACTICE 6 problems

1 Write one possible context for y = 3x + 4. Tell what x and y represent.

ANSWER _____

2 Write one possible context for y = -2x + 15. Tell what the negative rate means.

ANSWER _____

3 Write one possible context for y = 1/2x + 6. Use a situation where a fractional rate makes sense.

ANSWER _____

4 This table shows a linear relationship. x: 0, 2, 4 y: 8, 14, 20 Write a context for the table. Tell what happens every 2 units of x.

ANSWER _____

5 A line on a graph crosses the y-axis at 2 and rises 5 units for every 1 unit it moves right. Write a context for this graph.

ANSWER _____

6 Write one possible context for y = -3/4x + 10. Tell what x and y represent.

ANSWER _____

APPLY IT Show your work

1 The equation y = 6x + 18 models a school club's ticket money. Create a context that explains the equation. Include what x and y mean.

WORK SPACE

ANSWER _____

2 A student tracks data left on a tablet. Days used, x: 0, 2, 4 Data left in GB, y: 24, 18, 12 Create a context for the table. Explain what the change in the table means.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Create a realistic context for y = -2x + 30. State what x and y represent, explain the starting amount and rate of change, and give a reasonable domain for x.

_____

_____

ANSWER KEY

Start, Change, Story

GRADE 8 · 8.PFA.3.f

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write one possible context for y = 3x + 4. Tell what x and y represent.	**A game player starts with 4 coins and earns 3 coins each level. If x is the number of levels played, y is the total number of coins.**
2	Write one possible context for y = -2x + 15. Tell what the negative rate means.	**A candle begins with 15 centimeters of wax. It burns 2 centimeters each hour, so after x hours, y centimeters of wax remain. The negative rate means the wax amount decreases.**
3	Write one possible context for y = 1/2x + 6. Use a situation where a fractional rate makes sense.	**A music playlist starts with 6 hours of songs. A student adds 1/2 hour of music each day, so after x days, y hours of music are on the playlist.**
4	This table shows a linear relationship. x: 0, 2, 4 y: 8, 14, 20 Write a context for the table. Tell what happens every 2 units of x.	**A snack stand has $8 at the start. It earns $6 every 2 hours, so after x hours, it has y dollars. Every 2 hours, the amount increases by $6.**
5	A line on a graph crosses the y-axis at 2 and rises 5 units for every 1 unit it moves right. Write a context for this graph.	**A rewards account starts with 2 points. A student earns 5 points for each book read, so after x books, the account has y points.**
6	Write one possible context for y = -3/4x + 10. Tell what x and y represent.	**A phone begins with 10 gigabytes of storage available. Each downloaded app uses 3/4 gigabyte, so after x apps are downloaded, y gigabytes of storage remain.**

PART 2 · APPLY IT

1. **A school club begins with $18 from a donation. It earns $6 for each ticket sold, so after x tickets are sold, the club has y dollars.** The 18 is the starting amount, and 6 is the amount added for each ticket. Accept any sensible context with these meanings.
2. **A tablet starts with 24 GB of data. The student uses 6 GB every 2 days, so after x days, y GB of data remain. The data amount decreases by 6 GB every 2 days.** The table starts at 24 when x is 0. The data decreases by 6 GB for each increase of 2 days, or 3 GB per day.

CHALLENGE

A portable charger starts with 30 percent battery. It loses 2 percent of its battery each hour, so after x hours, y percent battery remains. Here, x can be whole numbers from 0 through 15 because the battery cannot go below 0 percent.

Accept any realistic context that correctly matches the initial value and rate of change. Variable names may be described in equivalent ways, and reasonable units or domains may vary.