

Adding and Subtracting Positive and Negative Integers – Unit Synopsis

Lesson 1: SWBAT add and subtract positive and negative integers

1. Do Now

Students are asked to complete simple subtraction problems, some of which have negative answers. Students are then asked to sort the problems into two categories and name the categories.

- **Rationale:** Students will have had limited exposure to negative numbers, so the activity allows them to recognize that there are problems that require you to subtract a large number from a smaller one. The sorting activity calls on students to differentiate between the two types of problems presented: those with positive solutions and those with negative solutions.

2. Two-Column Notes

Students first define the terms integer and opposite. Next, they learn the steps for finding the solution to a simple problem using the number line using the following steps:

1. *Start at the first number.*
2. *Choose a direction (+ means to the right; - means to the left)*
3. *Circle your final answer*

Students will practice using these steps with a variety of problems (negative plus positive; negative minus positive), using the checkboxes to remind them of the steps.

Lastly, students will use the commutative property of addition to solve a problem that requires them to add a negative integer. They will rewrite “ $5 + -3$ ” as “ $-3 + 5$,” then solve using the steps outlined above.

Lesson 2: SWBAT recognize the inverse relationship between addition and subtraction with regard to positive and negative integers.

1. Do Now

Students are asked to solve a problem with integers, then use the same digits (in the same order) to write a different problem with the same answer.

- **Rationale:** Students will begin to recognize that you can change the signs and the operation in order to determine the same solution. Once the class moves on to the notes, we can refer back to the Do Now to show that for each problem, we changed the operation and reversed the sign of the second number to create an expression with the same solution as the original problem.

2. Two-Column Notes

First, students will define the term inverse and relate it to other topics covered previously in class. Next, they will solve a simple addition problem involving integers, then solve a problem using the same digits with the inverse operation (subtraction). We will use the problems completed on the Do Now to identify the idea that adding a negative number is the same as

subtracting the same number. Students will articulate the idea and write it in their notes. Lastly, they will practice rewriting expressions using the inverse operation.

Lesson 3: Stations Activity

Students will work in pairs and travel among 5 stations, each with a different example of how we apply negative integers in real life:

1. Football Stadium
2. Weather Station
3. SCUBA Steve's
4. The Airport Runway
5. Banco Popular

At each station, students are required to use the visual representations provided and apply their knowledge of integers to solve a variety of problems. Students will have approximately 10 minutes at each station, and they will be expected to collaborate with their partner to solve the problems. At the end of the activity, students will hand in the work they have completed for a classroom grade.

Rationale: This activity engages multiple learning styles and intelligences, and it allows students to interact with negative integers in a concrete way. The diagrams engage visual learners and the process of solving the problems engages auditory learners. The activity also allows for kinesthetic activities; for example, one or more stations can be displayed on the board, and students can manipulate magnets in order to determine a solution.

In addition, this activity makes the process of using negative numbers less abstract, because students are able to apply what they know to concrete situations.

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DO NOW

Solve.

1.) $5 - 3 =$ _____

6.) $6 - 5 =$ _____

2.) $2 + 4 =$ _____

7.) $5 - 6 =$ _____

3.) $4 - 5 =$ _____

8.) $8 - 10 =$ _____

4.) $8 - 7 =$ _____

9.) $12 - 4 =$ _____

5.) $6 - 8 =$ _____

10.) $5 - 10 =$ _____

Now organize the problems into 2 categories. Copy the problems in the columns below.

Category 1:	Category 2:
Problem	Problem

Name _____ Date _____

Subject Math 6 Homeroom _____

Adding and Subtracting Integers

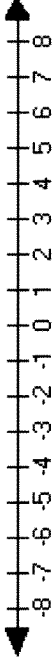
Integer

Opposite

Example 1

Step 1

$4 - 6$



Step 2

Step 3

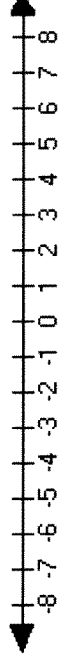
Example 2

Step 1

Step 2

Step 3

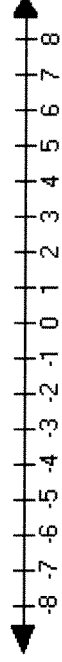
2.) $-5 + 8$



Example 3

- Step 1
- Step 2
- Step 3

3.) $-4 - 2$

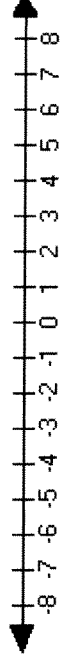


Example 4

Commutative Property of Addition

4.) $5 + -3$

We can rewrite the problem as



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Subject Math 6 _____ Homeroom _____

DO NOW.

Math challenge!

Look at the integer problems shown below. How can you use the **same digits in the same order** to write a new problem that has the **same answer**?

Example

Original Problem	Answer	New Problem	Answer
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$5 + -6 = -1$	-5	$-$	$+ 6 = -1$
	↑ sign	↑ operation	↑ sign

Original Problem	Answer	New Problem	Answer
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$6 - 8 =$ _____ 6 _____ $8 =$ _____

$-5 - 3 =$ _____ 5 _____ $3 =$ _____

$-7 + -10 =$ _____ 7 _____ $10 =$ _____

$4 + -8 =$ _____ 4 _____ $8 =$ _____

$-9 + 6 =$ _____ 9 _____ $6 =$ _____

Name _____ Date _____

Subject Math 6 Homeroom _____

Inverse Operations with Integers

Inverse

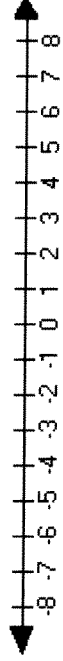
Step 1

Solve.

Step 2

$5 - 8$

Step 3



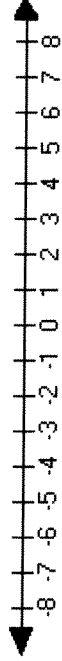
Step 1

Solve.

Step 2

$5 + -8$

Step 3



These answers are the same because...

Solve, then write the inverse operation for each of the following expressions.

1.) $7 - 3 =$ _____

_____ = _____

2.) $-6 + -3 =$ _____

_____ = _____

3.) $-4 - 2 =$ _____

_____ = _____

4.) $8 - 10 =$ _____

_____ = _____

5.) $6 - 2 =$ _____

_____ = _____

6.) $-3 - 9 =$ _____

_____ = _____

7.) $5 + -10 =$ _____

_____ = _____

8.) $12 - 8 =$ _____

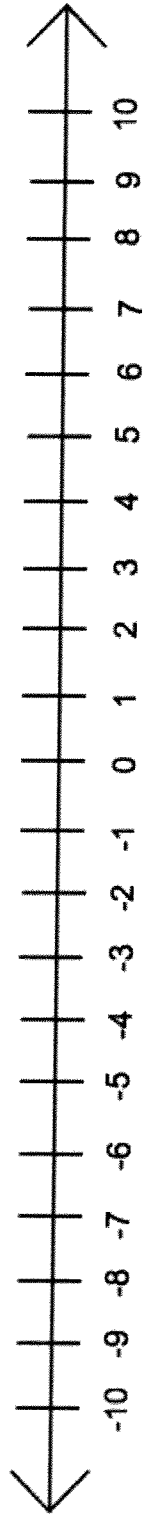
_____ = _____

9.) $-7 - 3 =$ _____

_____ = _____

10.) $2 + -4 =$ _____

_____ = _____



QUIZ

Name _____ Date _____

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Solve.

1.) $7 - 9 =$ _____

2.) $-3 + 5 =$ _____

3.) $-5 - 4 =$ _____

4.) $10 - 12 =$ _____

5.) $-6 + -3 =$ _____

6.) $-4 + 4 =$ _____

7.) $1 - 8 =$ _____

8.) $5 + -9 =$ _____

9.) $-14 + 6 =$ _____

10.) $-3 - 5 =$ _____

For each of the following expressions, write the operation that was performed to get the answer.

11.) $-3 \square 2 = 1$

12.) $5 \square 6 = -1$

13.) $-4 \square 7 = -11$

14.) \square

15.) \square

16.) \square

Solve each of the following expressions, then write an expression that shows the inverse operation.

17.) $-5 + -2 =$ _____

_____ = _____

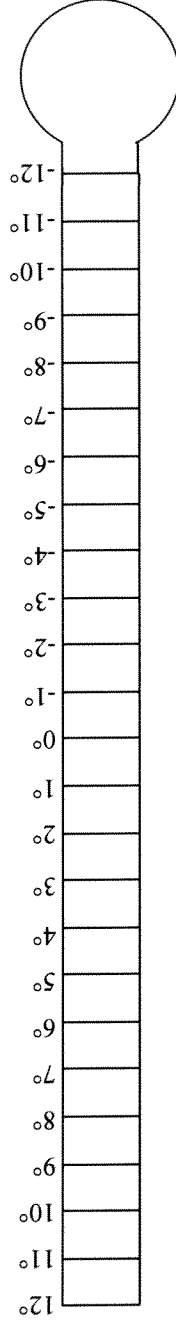
18.) $3 - 7 =$ _____

_____ = _____

19.) _____

20.) _____

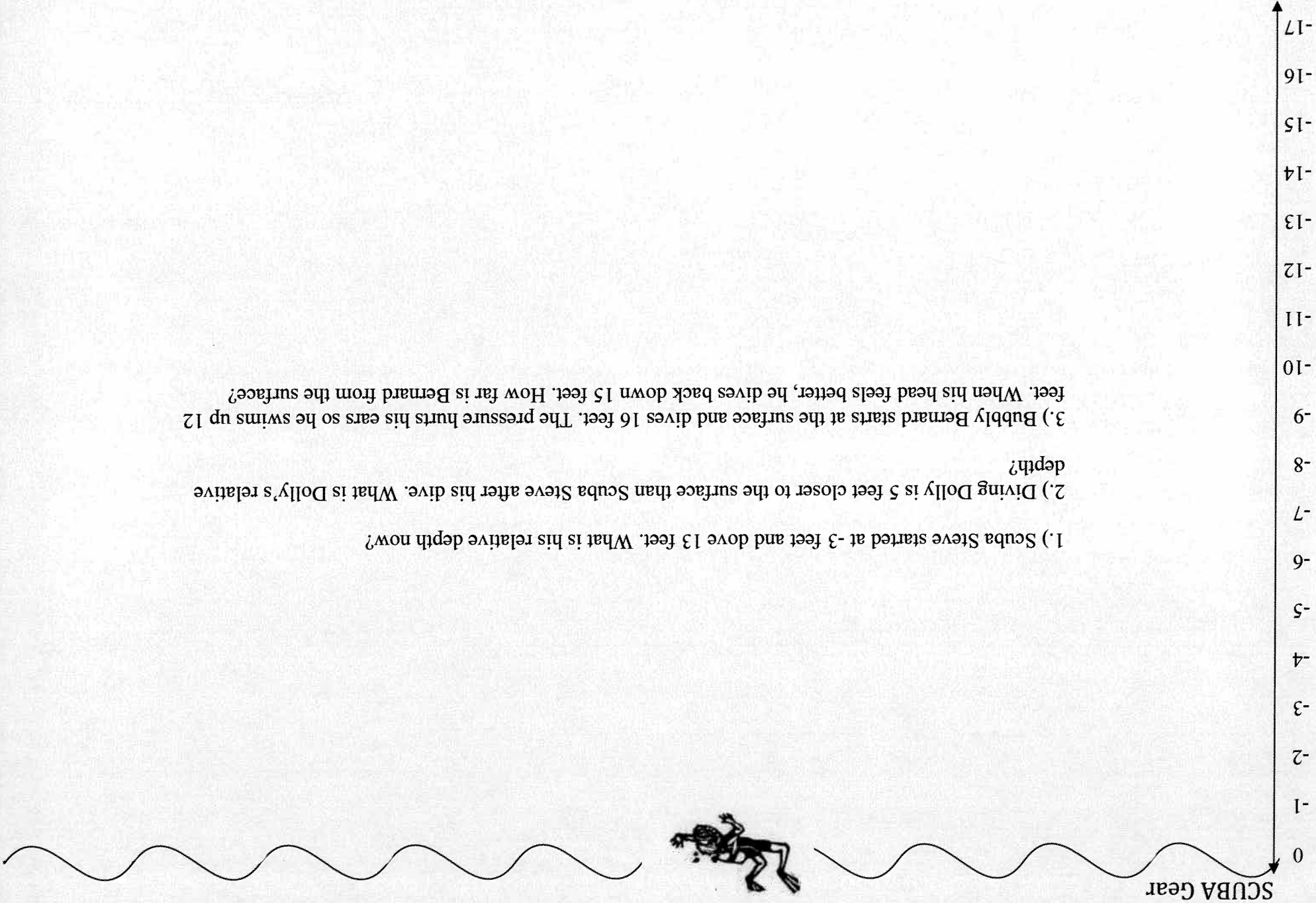
Doppler RADAR



1.) On this date last year, the temperature in Dzalinda, Siberia was -11° . If today's temperature in Dzalinda is 15° higher than this date last year, what is the temperature there today?

2.) The inside of a frozen steak is -9° . Ms. Lewkowicz leaves the steak on the counter to thaw while she teaches science. When she checks after class, the temperature inside the steak is 4° . Describe the change in the steak's temperature.

3.) It is only -2° outside today! Your tongue will stick to a flagpole any time the temperature is colder than 5° outside. Valeria dares you to lick the flagpole at Orient Heights. The weatherman says that tomorrow the temperature will rise 8° . Should you lick the pole today or tomorrow?



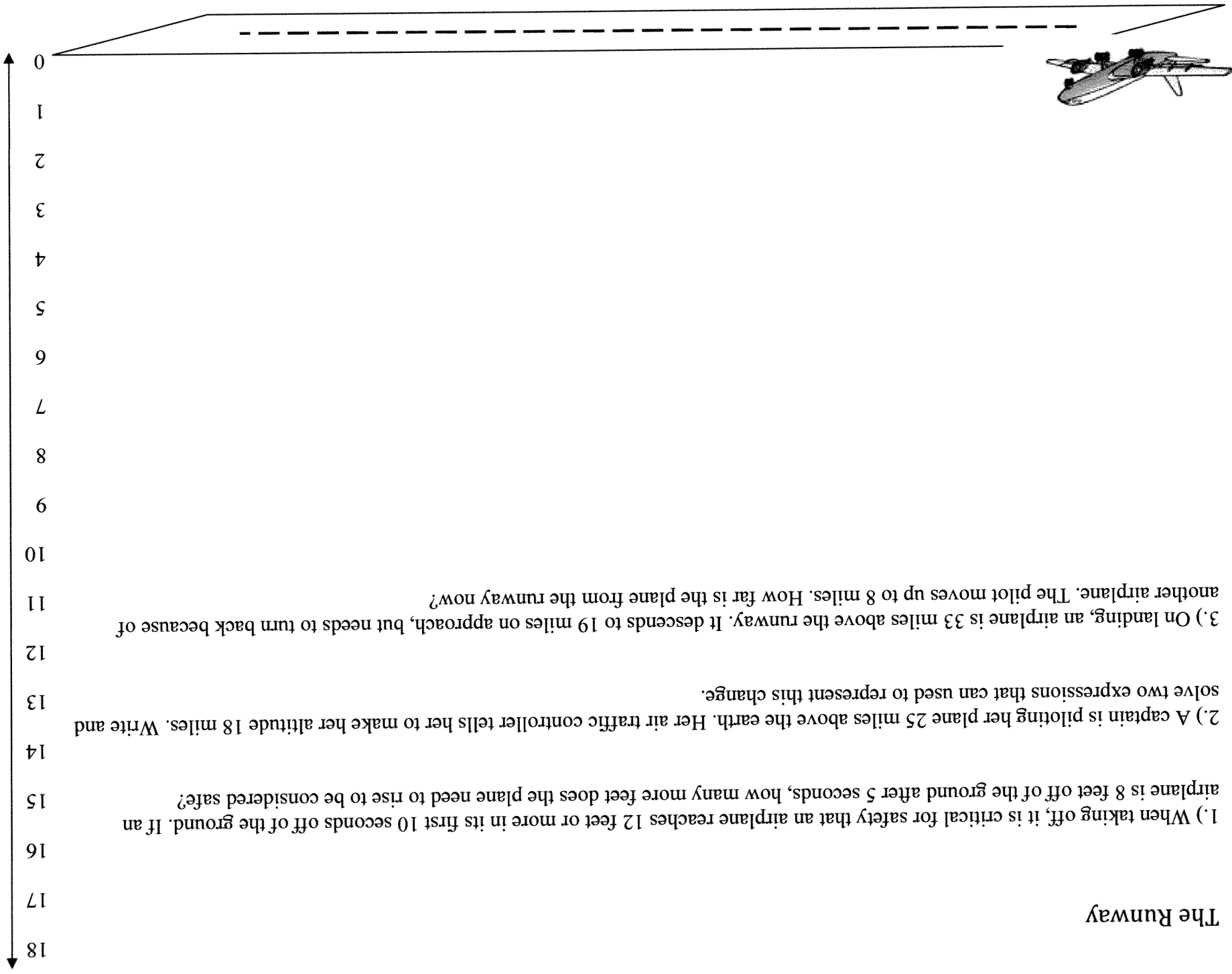
- 1.) Scuba Steve started at -3 feet and dove 13 feet. What is his relative depth now?
- 2.) Diving Dolly is 5 feet closer to the surface than Scuba Steve after his dive. What is Dolly's relative depth?
- 3.) Bubbly Bernard starts at the surface and dives 16 feet. The pressure hurts his ears so he swims up 12 feet. When his head feels better, he dives back down 15 feet. How far is Bernard from the surface?

The Runway

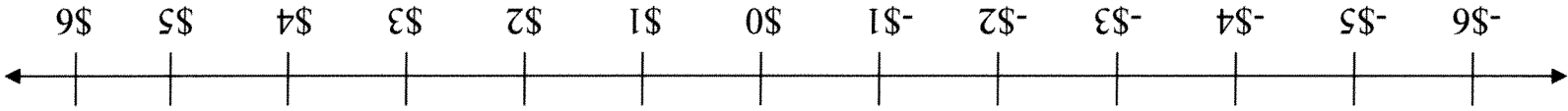
1.) When taking off, it is critical for safety that an airplane reaches 12 feet or more in its first 10 seconds off of the ground. If an airplane is 8 feet off of the ground after 5 seconds, how many more feet does the plane need to rise to be considered safe?

2.) A captain is piloting her plane 25 miles above the earth. Her air traffic controller tells her to make her altitude 18 miles. Write and solve two expressions that can be used to represent this change.

3.) On landing, an airplane is 33 miles above the runway. It descends to 19 miles on approach, but needs to turn back because of another airplane. The pilot moves up to 8 miles. How far is the plane from the runway now?



BANCO POPULAR



- 1.) Juan Pablo deposited \$70 into a checking account. When he paid his electric bill, \$45 came out of his account. Write and solve an expression using positive and negative integers to represent the amount of money Juan Pablo has left in his account.
- 2.) Merix spends \$5 on lip gloss and then she mows Mr. Pangburn's lawn and makes \$11. She wants to buy two more lip glosses, does she have enough money?
- 3.) Alejandro is selling his soccer ball for \$18. Mateo already owes Alejandro \$3. How much money does Mateo need to buy the soccer ball?