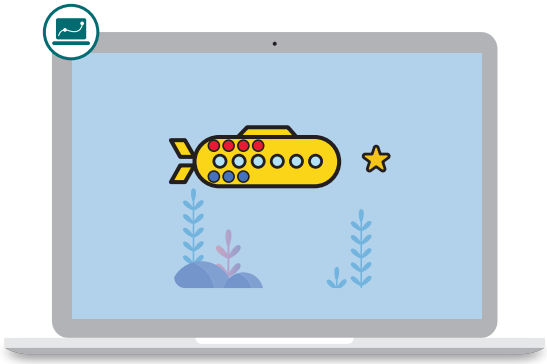
Name: _____ Date: _____ Period: _____

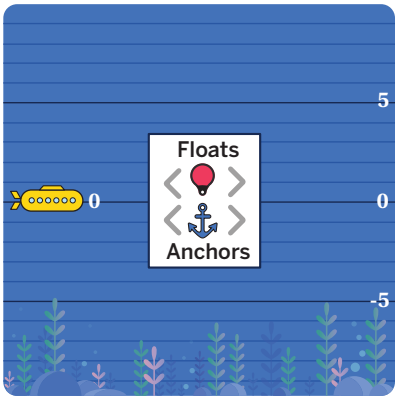
Floats and Anchors

Let's use floats and anchors to represent values on a number line.



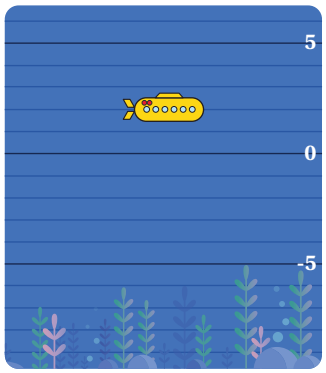
Warm-Up

1 This submarine is controlled by floats and anchors.

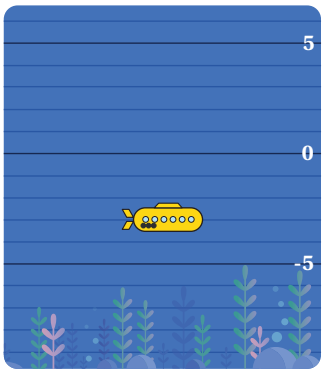


a Take a look at these different combinations.

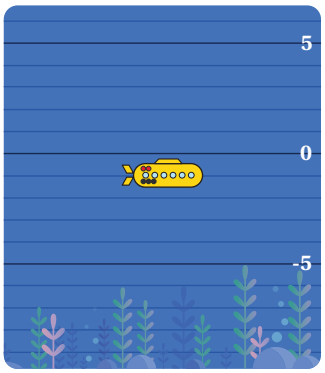
Add 2 floats



Add 3 anchors



Add 2 floats, Add 3 anchors



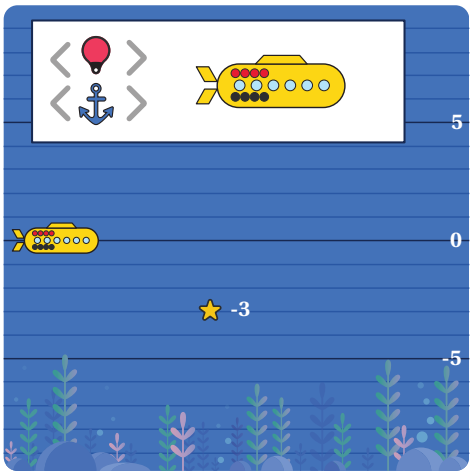
b **Discuss:** What do you notice? What do you wonder?

Activity 1

Name: ..... Date: ..... Period: .....

Collect the Star

2-3 This submarine starts with 4 floats and 4 anchors.



a **Discuss:** Why do you think this submarine's current position is at 0 units?

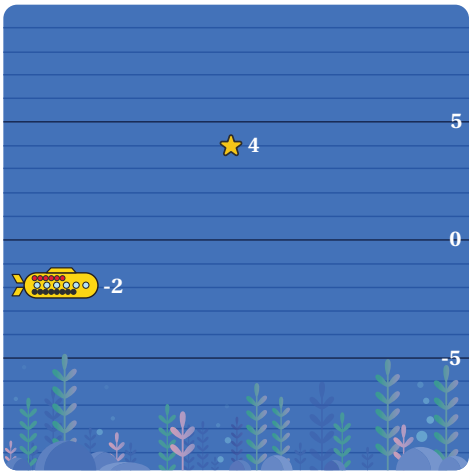
b The table shows one way to move the submarine to -3 to get the star. Write three more actions to get the submarine to -3.

Start	Action	Final
0	Remove 1 float Add 2 anchors	-3
0		-3
0		-3
0		-3

4 This submarine starts with 6 floats and 8 anchors.

The submarine has space for up to 10 floats and up to 10 anchors.

Write an action that could move the submarine to 4 units to collect the star.



Start	Action	Final
-2		4

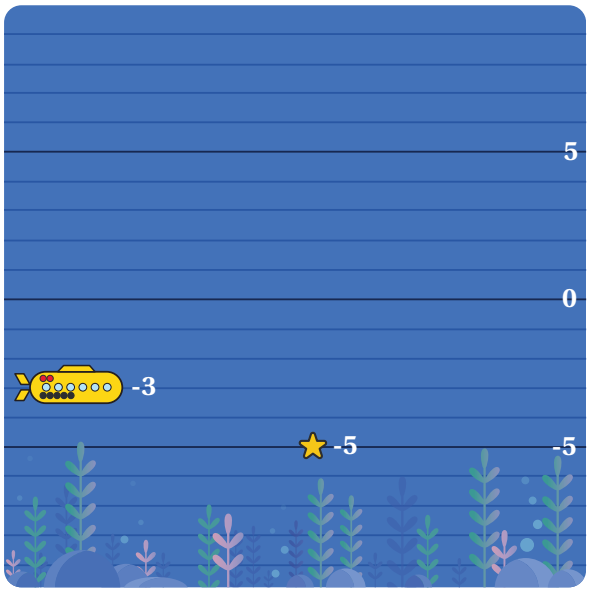
Name: ..... Date: ..... Period: .....

Collect the Star (continued)

5 This submarine starts at -3 units.

Select *all* the actions that would move it to -5 units.

- ☐ **A.** Add 2 floats
- ☐ **B.** Add 2 anchors
- ☐ **C.** Remove 1 float and add 1 anchor
- ☐ **D.** Add 3 floats and add 5 anchors
- ☐ **E.** Remove 2 floats and add 4 anchors



6 Imagine a new submarine. For each action, put a check for whether the submarine would go up, go down, or stay in the same position.

Action	Up	Same Position	Down
Add 3 floats Add 4 anchors			
Remove 10 anchors			
Remove 5 floats Remove 5 anchors			
Add 8 floats Remove 8 anchors			
Add 6 floats Add 2 anchors			
Remove 7 floats Add 3 anchors			

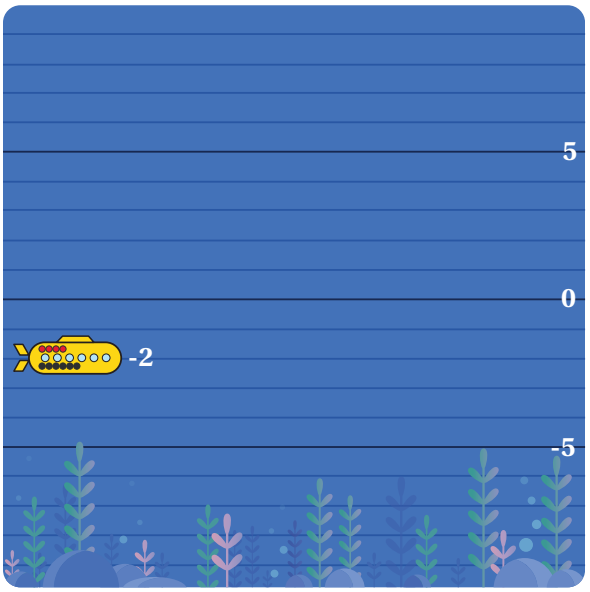
Name: ..... Date: ..... Period: .....

Sea-king Stars

7 The table shows the submarine's starting position and the action that will change its position.

What will be the submarine's final position?

Start	Action	Final
-2	Add 3 floats Remove 5 anchors	



8 Crow and Mai wrote expressions to answer the previous question.

Crow's expression: $-2 + 3 - 5$

Mai's expression: $-2 + 3 - (-5)$

Who wrote a correct expression? Circle one.

Crow Mai Both Neither

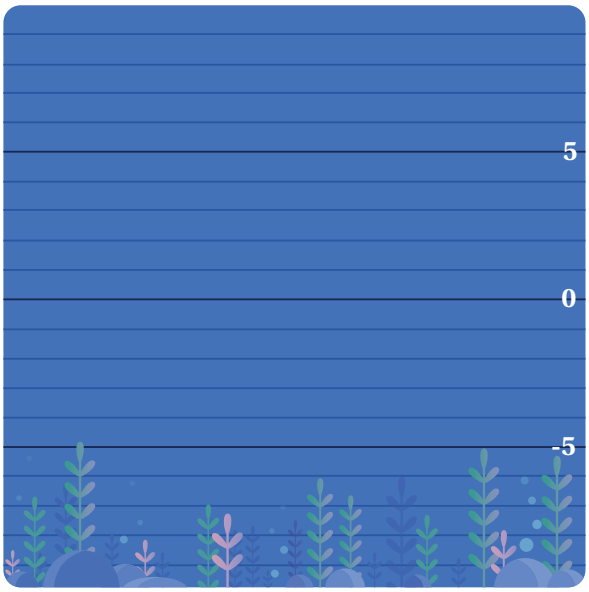
Explain your thinking.

Activity 3

Name: ..... Date: ..... Period: .....

Captain's Challenge

9 What is the final position of each submarine? Complete as many challenges as you have time for. Use the image if it helps with your thinking.

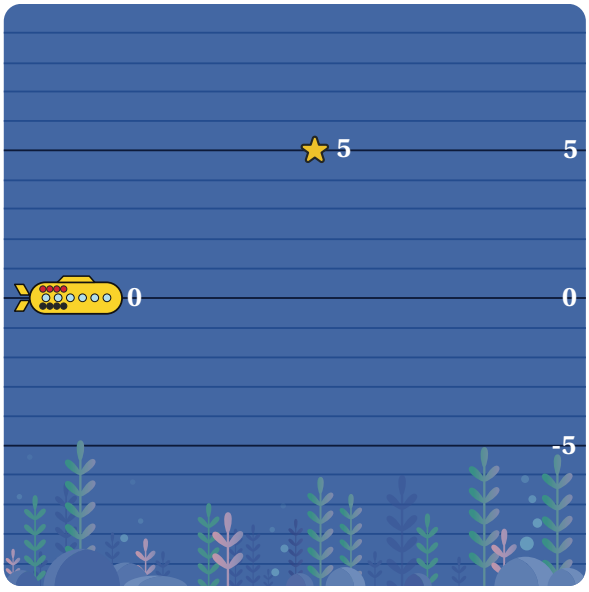


Start	Action	Final
0	Add 3 floats Add 7 anchors	
-9	Add 8 floats Remove 6 anchors	
1	Remove 3 floats Add 4 anchors	
-3	Remove 1 float Add 3 anchors	
-4	Remove 1 float	
5	Remove 8 floats Remove 3 anchors	
-2	Add 5 floats Remove 2 anchors	
-5	Add 1 float Remove 2 anchors	

10 Synthesis

Describe a set of actions that would allow this submarine to collect the star at 5 units.

Try to come up with something none of your classmates will.



Things to Remember: