

Ari's Mars Landing

Name: Answer Guide

Date: _____

Vocabulary

Compass - a tool used to show the current directions based on Earth's magnetic field

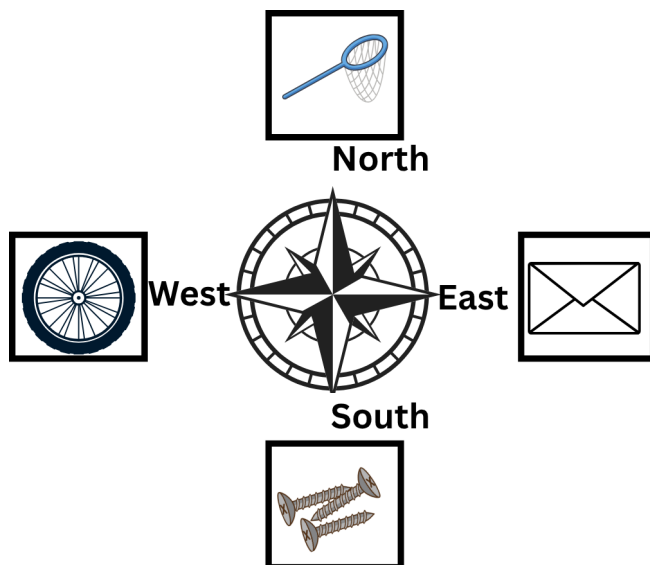
Cardinal Directions - the four main compass directions: North, South, East, and West

Intermediate Directions - directions northeast (NE), southeast (SE), southwest (SW), and northwest (NW) located halfway between the four cardinal directions.

Introduction

Cardinal and Intermediate Directions

- 1 The compass is labeled with directions to help you navigate. Help Ari pack for their Mars adventure. Find items that start with the same first letter as each cardinal direction on Ari's compass. Draw each item in the boxes.

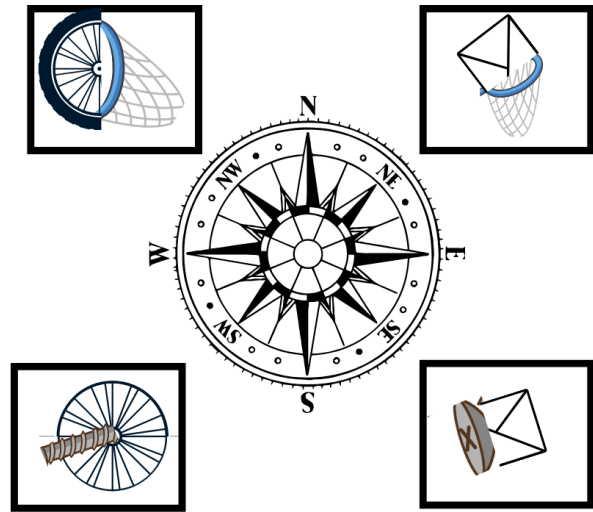


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2 In between the 4 cardinal directions are more specific directions called intermediate directions. These point out the halfway point in between the two cardinal directions. For example, halfway between North and East would be Northeast (NE). Help Ari create and pack these additional items for their adventure by creating items that are made of half of each of the cardinal direction images you found.



Activity 1

Ari's Mars Landing

1 Ari has landed on Mars! Since Mars has its own magnetic field, Ari needs to orient itself in order to use its compass to navigate. Place Ari at their landing spot and Set North based on the fact that North is the top of this map. From Ari's landing spot, what direction is each of the following landmarks?

Landmark	Direction from Ari's landing spot
 mountain	Northeast
 crater	North
 sand dunes	Southwest
 volcano	East
 ice	Northeast

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Key



mountain



crater



sand dunes



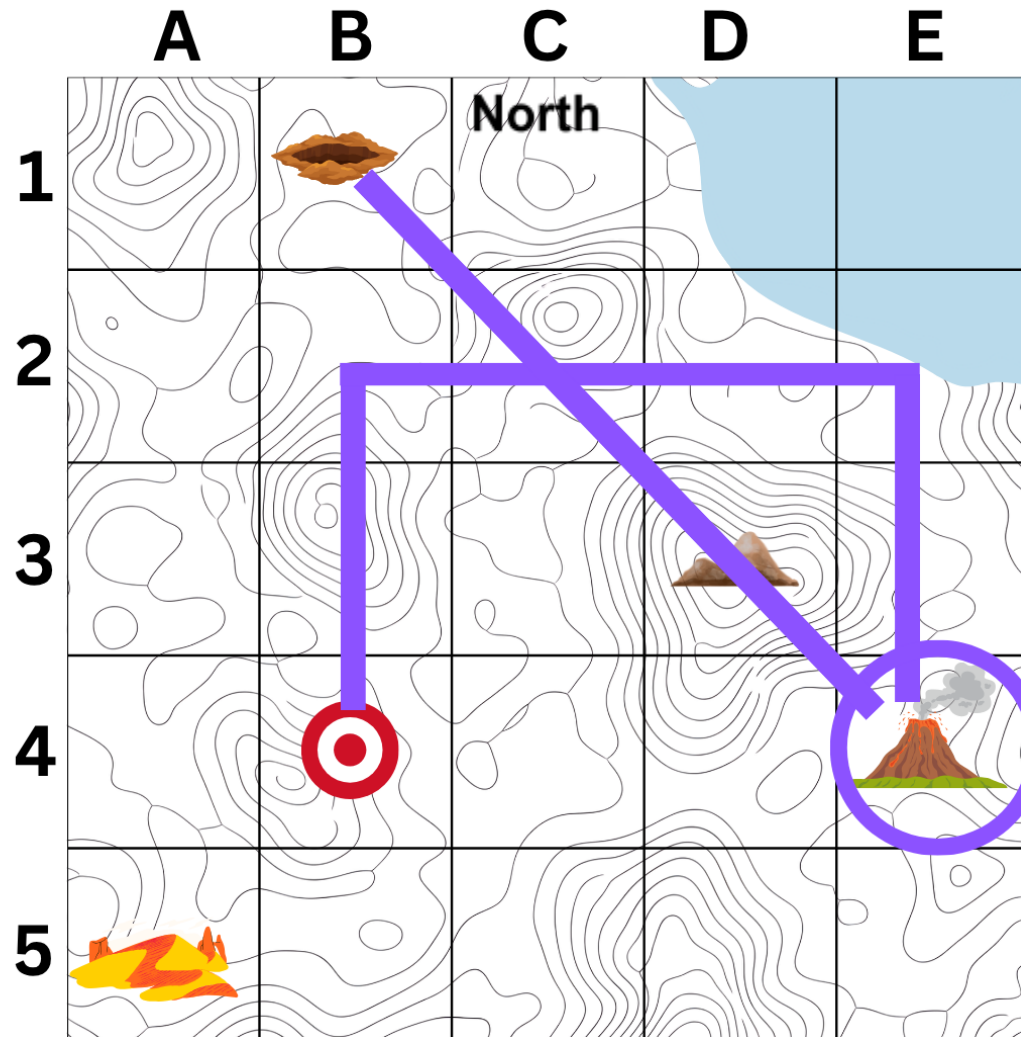
volcano



ice



Ari's landing spot



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2 Ari starts exploring the area. Use the directions below to move Ari around Mars on their exploration. Draw a line to show the trail that Ari takes.

Ari's Adventure

1. Ari begins at their landing spot.
 - Where are they located on the map? B4
2. Ari travels 2 units north.
 - Where are they located on the map? B2
3. Ari travels east 3 units.
 - Where are they located on the map? E2
 - Describe Ari's environment: Ice
4. From here, Ari travels 2 units to the south.
 - Circle the landmark where Ari arrives.
5. Ari travels three units Northwest to escape.
 - Where are they located on the map? B1
 - Why might it take Ari a long time to complete this part of their journey? They went over a mountain so they took a long time.
6. What feature is Ari near now? A crater



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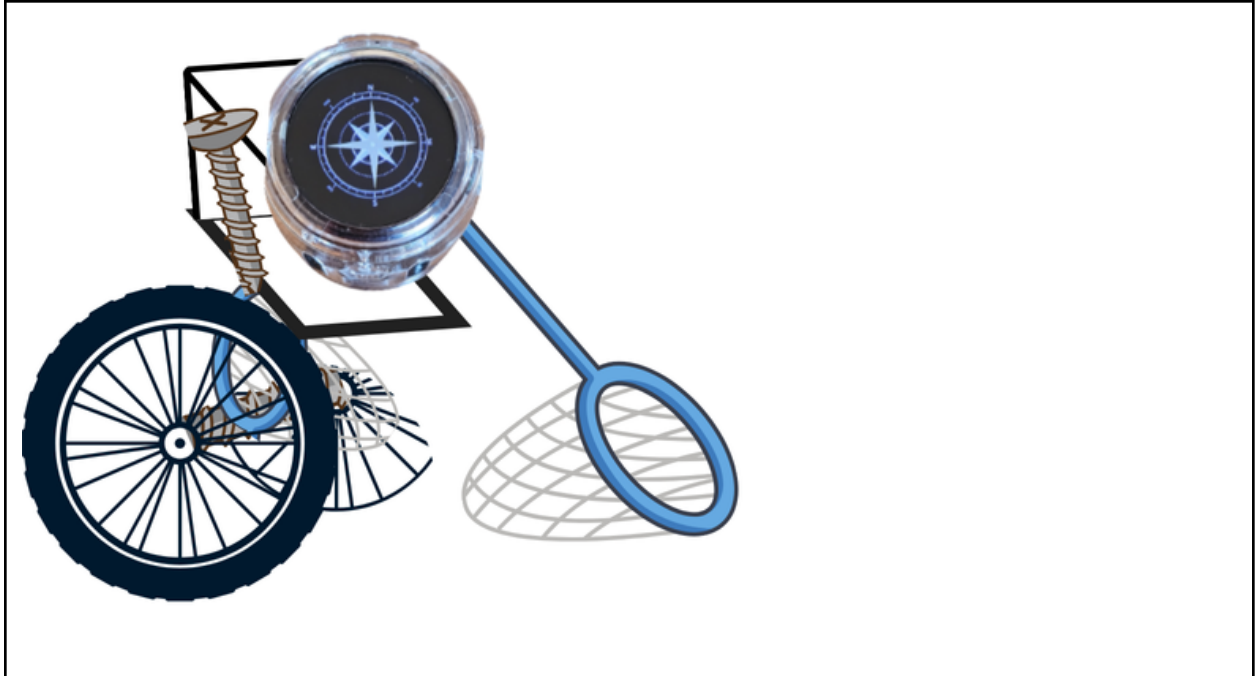
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Activity 2

Ari's Bad Day

1

Ari is stuck in a crater! Thankfully, they have all of the items that they packed with them from learning about the cardinal and intermediate directions. Draw an image to show how you think Ari can get themselves out of the crater using their items.



2

Explain your idea.

I would use my wheel and half wheel/half screw to make a set of wheels with a screw as an axle. I would then fold an envelope in half to make a seat and use a screw to keep it secure. I would use the half net/half screw to loop the axle and hold the seat. Ari will use a net as a paddle to guide itself out of the crater.

Note: Students will all have their own ideas for this question. This is just one possible idea.



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Exit Ticket

1. Now that Ari is out, they want to get back to their landing spot to reorganize their items. Help Ari navigate back to their landing spot by writing a set of directions using cardinal and/or intermediate directions.

Ari should move 3 units South.

2. Good news! Ari has been delivered a dump truck to help move sand from the sand dunes to the crater to make sure no one else gets stuck. Direct Ari to the sand dunes to get sand and then to back to the crater to dump the sand.

One possible answer:

Ari should move 1 unit southwest, fill their dump truck, move 3 units north, and then 1 unit northeast.

