Choose the Map

Map features and projections for a relief mission

6-9.WG.6.2 "Explain and use the components of maps, compare different map projections, and explain the appropriate uses for each."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline three map components the relief team uses, and circle what each one helps the team do. Number the three projections, then mark the job each projection does best.

Maps for a Winter Storm

1 After a winter storm, a relief team in Reykjavík, Iceland, plans deliveries to coastal towns. Its paper map is titled *Coastal Supply Routes*, so readers know its purpose. A legend explains that circles stand for clinics and triangles stand for harbors. A north arrow points to the top of the page, helping drivers describe which way to travel. The scale says one centimeter on the page represents twenty kilometers on the ground. A letter-and-number grid lets team members name a location without guessing which town someone means.

2 The team also studies maps of a much larger region. A Mercator projection shows many compass bearings as straight lines, which can help a ship hold a steady compass course. Those lines are not always the shortest paths. Mercator stretches land near the poles, making Greenland look much bigger than its true area compared with Africa. An equal-area projection keeps relative land areas accurate, so it is better for comparing the size of those places. It may change their shapes, however, and it does not make every direction or distance exact.

3 To plan flights from the Reykjavík supply center, the team uses an azimuthal equidistant map centered on Reykjavík. Distances and directions measured from that center are accurate on this projection, so the team can compare trips from the hub to different towns. Distances between two other towns may not be accurate. Before choosing any map, the team asks what decision it must make. A map that helps compare land area may be a poor choice for measuring a route, and a useful route map may distort the size of a place.

2 ANSWER WITH EVIDENCE

Use the passage

1. Two points are three centimeters apart on the team's paper map. How far apart are they on the ground, and which map component tells you?

2. A team member must identify a harbor, tell a driver where it is, and give a direction of travel. Which three map components help with these jobs?

3. Why is an equal-area projection a better choice than Mercator for comparing the sizes of Greenland and Africa?

4. Which projection should a pilot use to compare distances from Reykjavík to two towns? Why might it give a poor measurement between the towns?

3 YOUR TURN

Your own words

In four to five sentences, plan a map for an expedition from a coastal camp to three islands. Give the map a title, invent two legend symbols and a scale, then choose a projection for comparing distances from camp and explain why a different projection would be better for comparing island sizes.

ANSWER KEY

Choose the Map

GRADES 6-9 · 6-9.WG.6.2

PART 1 · READ AND MARK

Underline three map components the relief team uses, and circle what each one helps the team do. Number the three projections, then mark the job each projection does best. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Two points are three centimeters apart on the team's paper map. How far apart are they on the ground, and which map component tells you?	**They are 60 kilometers apart. The scale gives the distance.**
2	A team member must identify a harbor, tell a driver where it is, and give a direction of travel. Which three map components help with these jobs?	**The legend identifies the harbor symbol, the grid helps name its location, and the north arrow helps give a direction.**
3	Why is an equal-area projection a better choice than Mercator for comparing the sizes of Greenland and Africa?	**An equal-area projection preserves their relative areas. Mercator stretches land near the poles, making Greenland look too large.**
4	Which projection should a pilot use to compare distances from Reykjavík to two towns? Why might it give a poor measurement between the towns?	**An azimuthal equidistant map centered on Reykjavík gives accurate distances from that center. Distances between two towns away from the center may be inaccurate.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

My map is titled *Island Research Trips*. In its legend, a star marks the camp and a square marks a landing site. The scale is one centimeter for ten kilometers. I would use an azimuthal equidistant projection centered on the camp to compare distances from camp to each island. For comparing the islands' sizes, I would switch to an equal-area projection because it preserves relative areas.

Accept any clear title, two distinct symbols with meanings, and a usable scale. The projection choices should match the stated distance and area comparisons.