Seeing Watersheds

This lesson is correlated to Grades 4-8 and recommended for upper elementary and middle school aged children. The lesson is correlated as written in the *Project WET Curriculum and Activity Guide 2.0* is are meant to show how activities support a standard, performance expectation and/or three-dimensional learning. NGSS correlations are provided in detail in a separate document to demonstrate how the content of the activity provides a three-dimensional learning experience. Common Core State Standards correlations for grade spans assume that teachers will be familiar with the standards for their respective grade level(s) and be able to apply them judiciously.

Summary: Students use maps to characterize what a watershed is; to identify the key parts and functions of watersheds; to determine watershed boundaries; to discover how watersheds are named; and to describe how water flows in a watershed based on elevation.

Common Core: *ELA*: RH.6-8.7; RST.6-12.2; RST.6-8.7

NGSS: 4-ESS2-1, 4-ESS2-2, 5-ESS2-1, 5-ESS2-2

Instructions for Educators

1. Distribute the pdf lesson of Seeing Watersheds to students.
2. Have them complete the lesson as instructed.
3. Ask students to turn in the completed lesson and student pages to you.
4. Research your local watershed so that you know what watershed you live in and what bigger wastershed you are a part of.
5. To download the full Seeing Watersheds activity for free including background information, objectives and full instructions for classroom use, go to store.projectwet.org/covid-19-free-resource-downloads.html.
6. See answer key on following pages for this lesson.

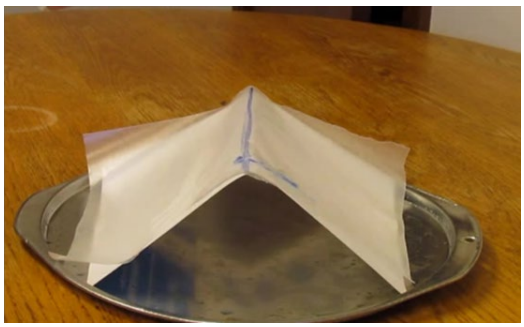
Pre-Activity Questions:

1. Do you know what a watershed is? Pick the best answer:
    a. A shed with water
    b. A giant body of water
    c. An area of land that drains to a common river
    d. A river that drains into the ocean

2. What watershed do you live in? (You will need to research this yourself. Ask your city or local water utility)

Procedure

Warm Up



1. Fold your wax paper or aluminum foil in half and set it up to look like the photo by placing it on a cookie sheet or large plate.
2. Spray or SLOWLY pour some water on one side of the fold in the wax paper or aluminum foil.
3. What happens to the water? The water:
    a. Stayed in place
    b. Moved up the paper slope
    c. Moved down the paper slope
4. What force moves water?

    Try This!

    Take your pen or pencil and hold it in front of you then let go. What happened? What is the force responsible for this?

    Gravity

5. Spray or SLOWLY pour water on the fold of the wax paper or aluminum foil. How did the water move? Did it move down one side or both sides?

    Both sides

Next, crumple your paper or foil as in the picture. Spray or SLOWLY pour some water over the wax paper or aluminum foil.

6. What happened to the water on the wax paper or foil? Describe how water moved over the folds.
   Water moves down the paper through different folds or valleys on the paper. It pools in some areas and may run onto the cookie sheet for some.

7. The wax paper represents an area of land to show how water moves and pools. Pools represent lakes, and water movement represents rivers.

Activity

See Teacher Answer Keys Pages

Assessment

1. Water flows from high to low elevations. Are the headwaters and tributaries of a river at a high or low elevation compared to the main stem?
   a. High
   b. Low

2. Is the main stem of a river at a high or low elevation?
   a. High
   b. Low

3. Given that the headwaters of the river and tributaries are at high elevations, what do the lines connecting the dots represent?
   a. Ridgelines of hills/mountains
   b. Valleys
   c. Highways
   d. State boundaries

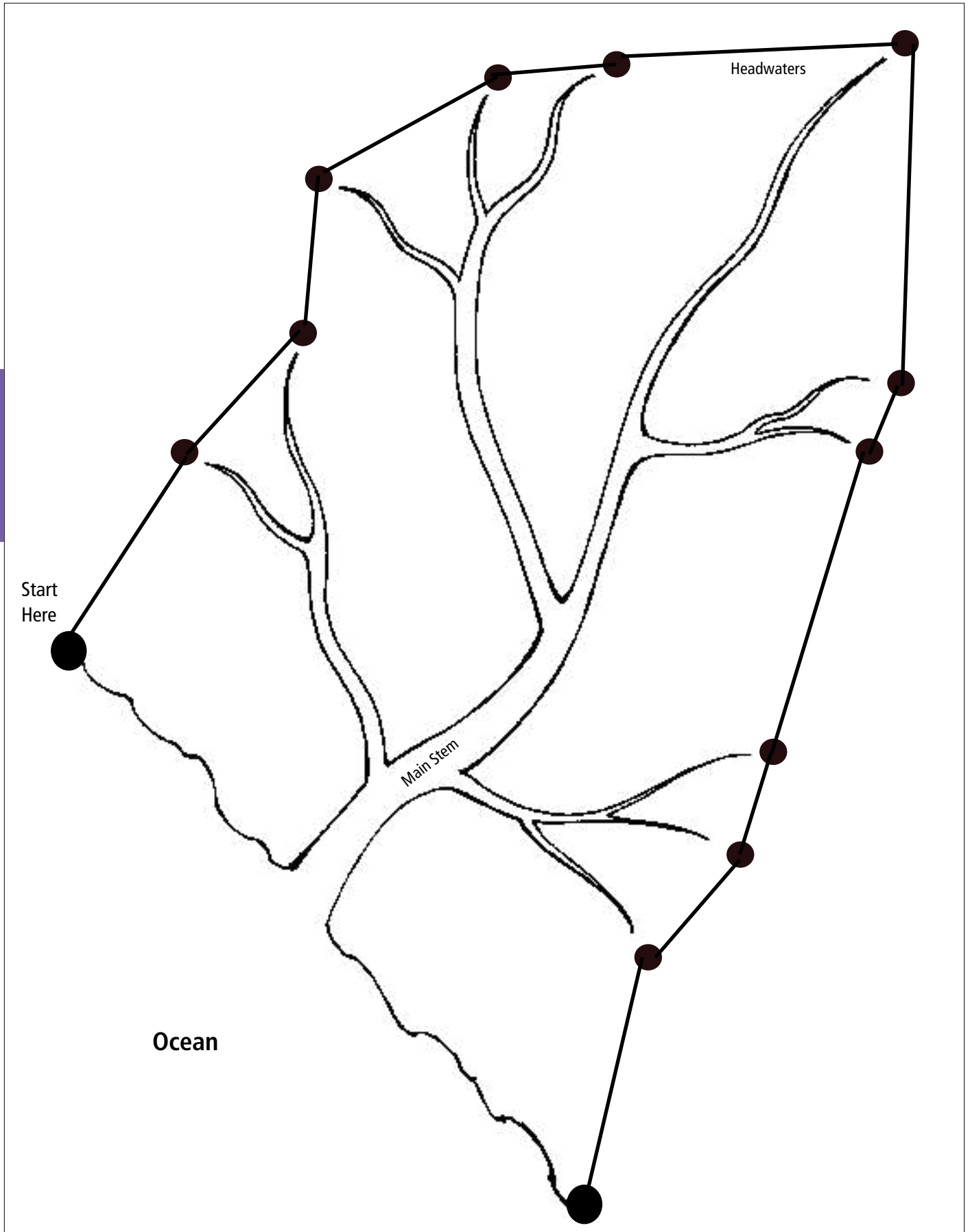
Your Local Watershed

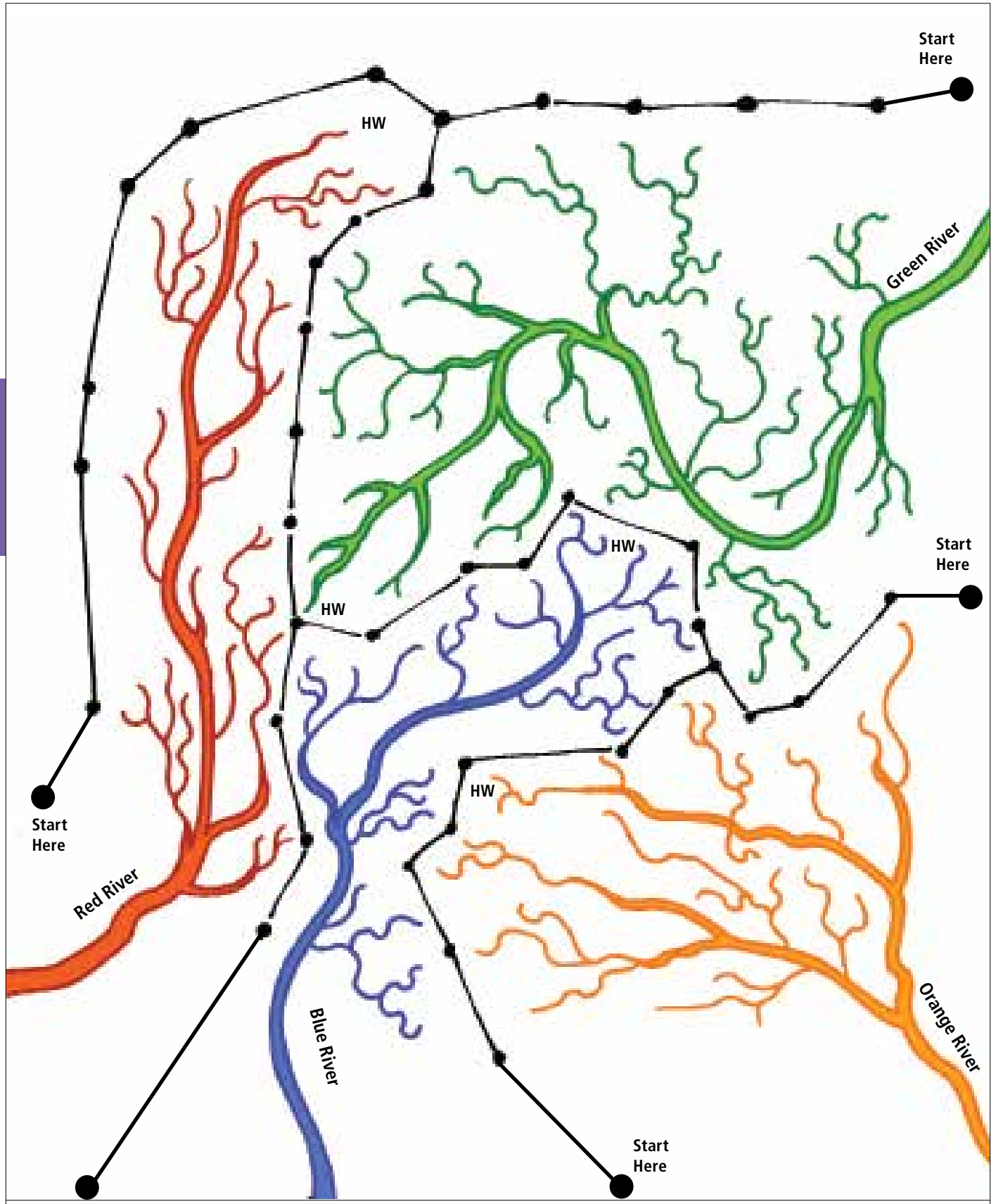
1. Research the watershed you live in. You can call your local water utility or city to learn about your watershed. It is very likely the major river near where you live. What is the major water source that water flows to?

You will need to research this yourself

2. What is the larger watershed you are in (for example Mid-Atlantic or Missouri)? Where does it start and where does it empty? Look at the map below to help you identify it.

You will need to research this yourself





HW - Headwaters

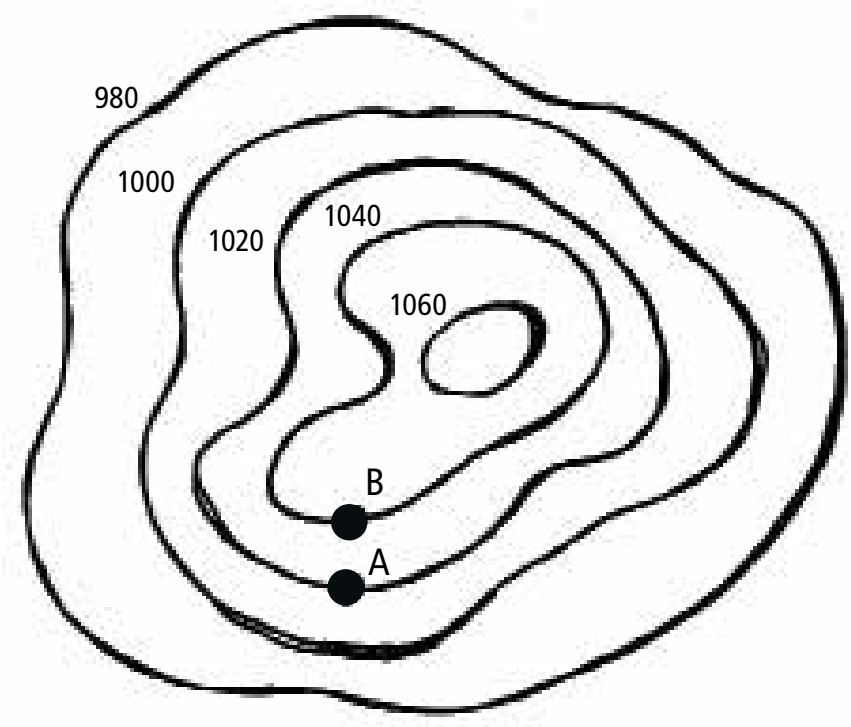
1. What information does a topographic map provide?

see below. Elevation or terrain are also acceptable answers

A topographic map indicates "relief." Relief is the difference in elevation between two points. If the relief is low, the area is flat, such as a river valley. If it is high, the slope is steep, indicating hills or mountains.

2. Study the simple map below. What do the lines indicate?

Contour lines



The lines are contour lines that connect points at the same elevation along a line.

2a. All points on line B are 1040 feet in elevation.

All points on line A are 1020 feet in elevation.

The contour interval is the difference in elevation between adjacent contour lines. (On the map, line B is adjacent [next to] line A.) Among topographic maps, contour intervals vary. Contour intervals are large for very steep areas (80-100 feet) but are smaller for lower areas (10-20 feet). Although contour intervals may vary, on a single map they are consistent (the same).

2b. What is the contour interval for the map above?

20 feet

The difference in elevation between line A and line B

is 20 feet feet.

Therefore, the contour interval is 20 feet.

Is the contour interval consistent (always 20 feet) for this map?

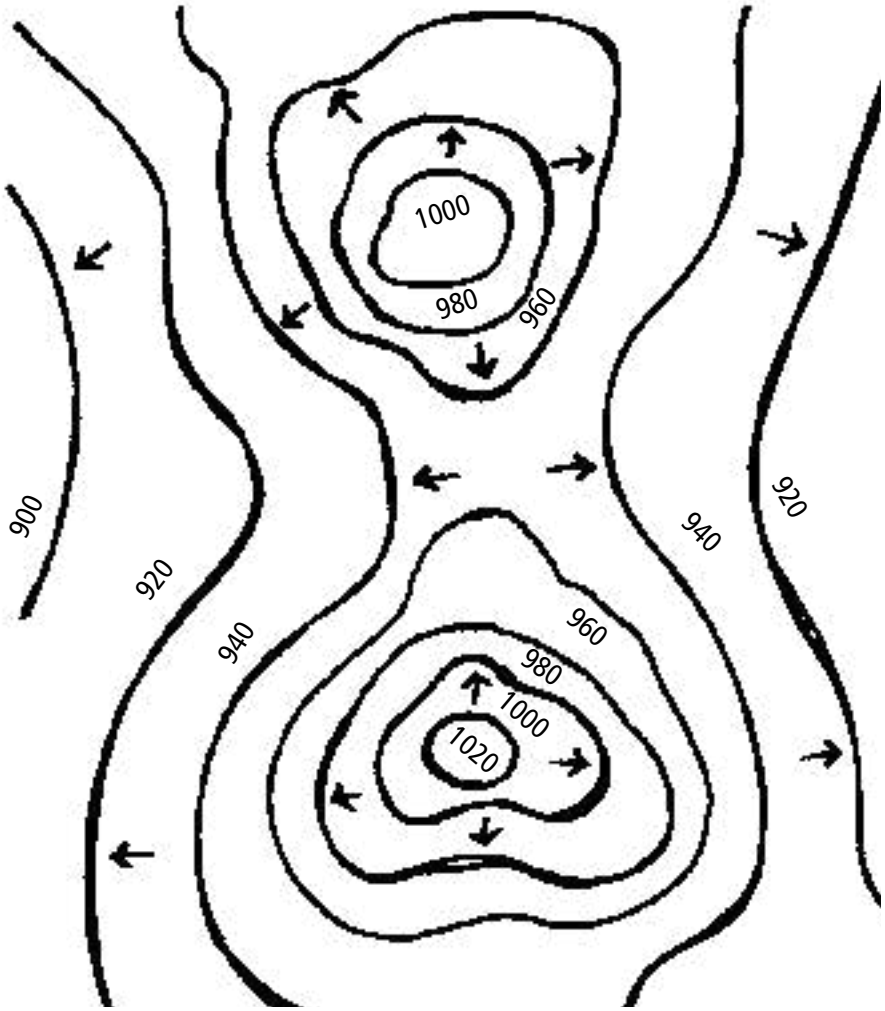
YES [YES or N0] The difference in elevation between each contour line is 20 feet.

What landform do you think this map represents?

A mountain or hill

Imagine that you are a bird flying over and looking down on this landform. The elevation at the top is the greatest, 1,060 feet, and continues to decrease as you move "down" the landform. Another way to think of this representation of a hill is a collapsible cup.

Imagine you had a collapsible cup. Turn it over so that the wide part (from which you would drink) is flat on the table. Now imagine pushing down on the cup, collapsing it. A topographic map is like that—the landforms are "collapsed" on paper.



KEY:

= direction of flow

3a. Now look at this more complicated topographic map. Study the contour lines and the contour interval. Imagine you are a bird flying over this area. The greatest elevation is at the top and tapers down to the bottom.

What are the landforms? Remember the shape of the hill in the first map.

This is a topographic map of two mountains or hills connected by a saddle [a ridge connecting two higher points].

3b. What do the arrows indicate? See the key.

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The arrows show the flow of water across the surface of the land. A general rule is that water runs perpendicular to contour lines.

4. Do watersheds only occur in hilly or mountainous areas where there are definite changes in elevation?

No. Everyone lives in a watershed!

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