RESPONSE SHEET—SCHOOLYARD MODELS

Adri and a group from her Girl Scout troop were studying a local park to find out the best place to put the new playground. They needed to present their plan to the city council. They hoped that the council would approve their plan.

She and her friends couldn't decide whether making a model of the playground or drawing a map would be the best way to present their ideas.

What do you think Adri and her friends should do? Write your ideas in the space below about whether to include a map, a model, or both in their presentation.

RESPONSE SHEET—SCHOOLYARD MODELS

Adri and a group from her Girl Scout troop were studying a local park to find out the best place to put the new playground. They needed to present their plan to the city council. They hoped that the council would approve their plan.

She and her friends couldn't decide whether making a model of the playground or drawing a map would be the best way to present their ideas.

What do you think Adri and her friends should do? Write your ideas in the space below about whether to include a map, a model, or both in their presentation.

FOSS Landforms Module
Investigation 1: Schoolyard Models
No. 4—Student Sheet
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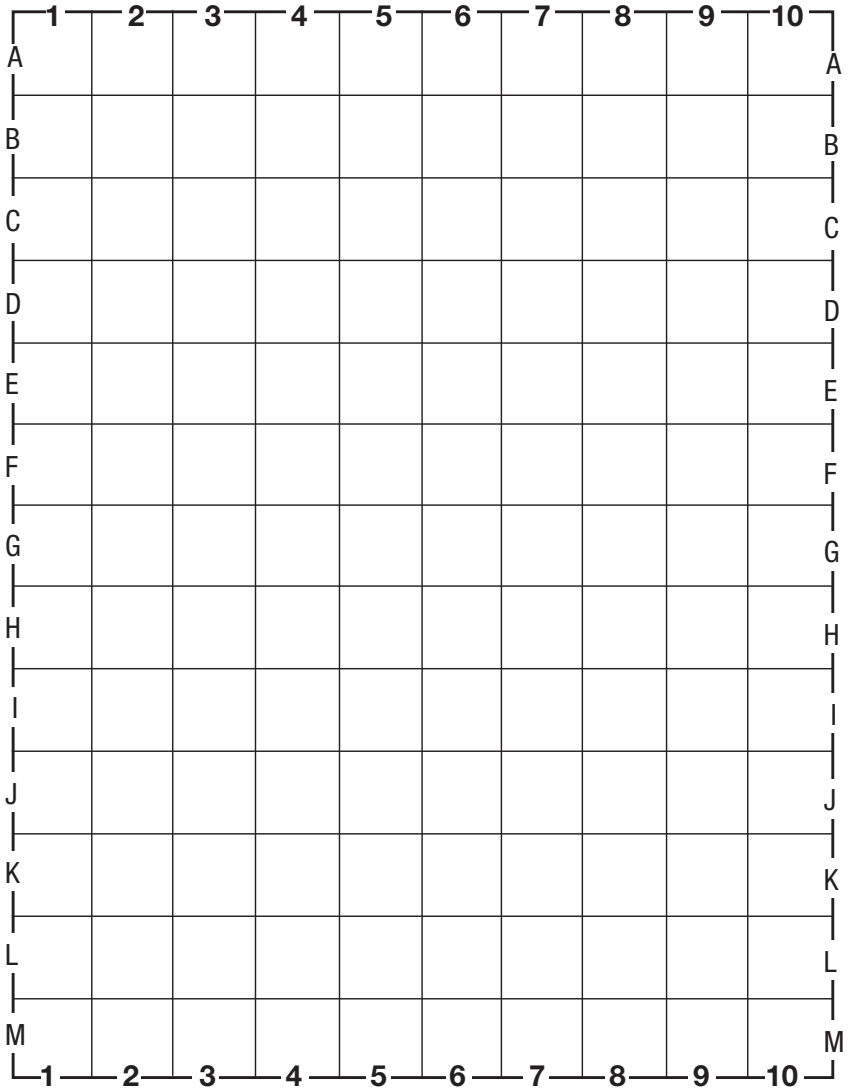
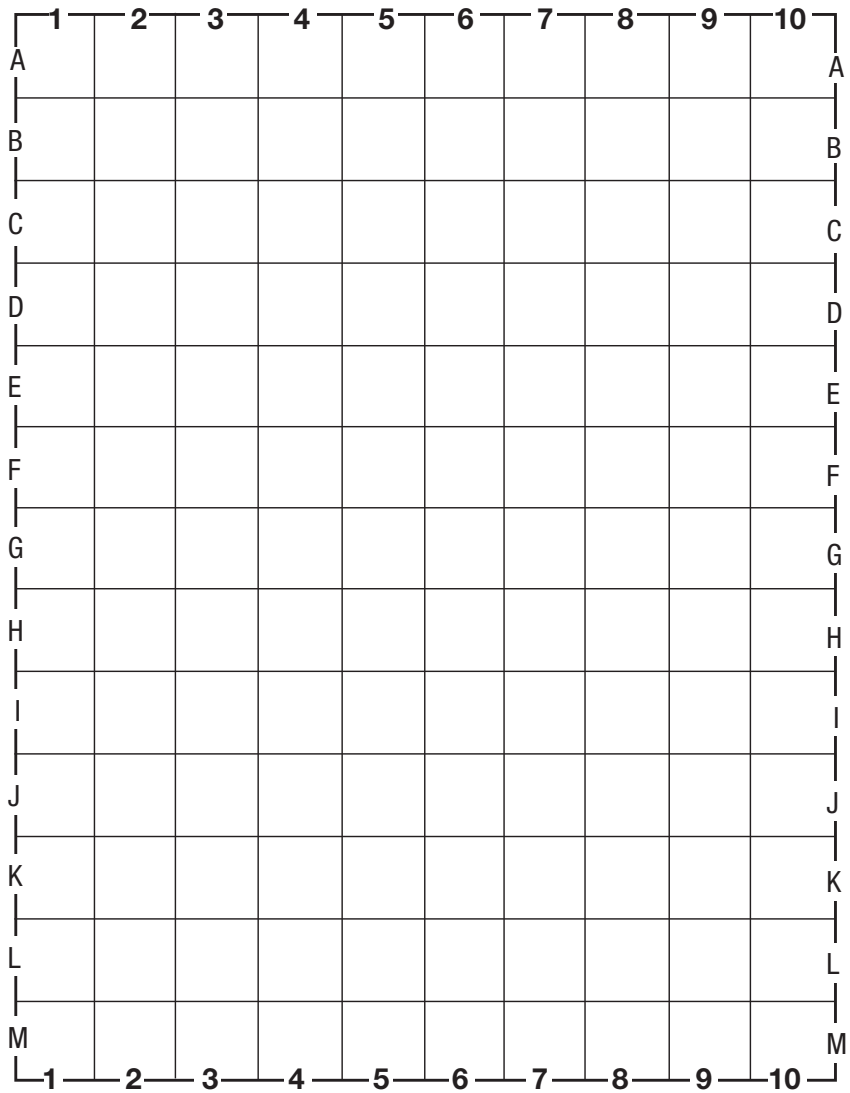
MAP GRID

TITLE



MAP GRID

TITLE



FOSS Landforms Module
Investigation 1: Schoolyard Models
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COLORADO PLATEAU MAP

COLORADO PLATEAU MAP

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Investigation 2: Stream Tables
No. 6—Student Sheet

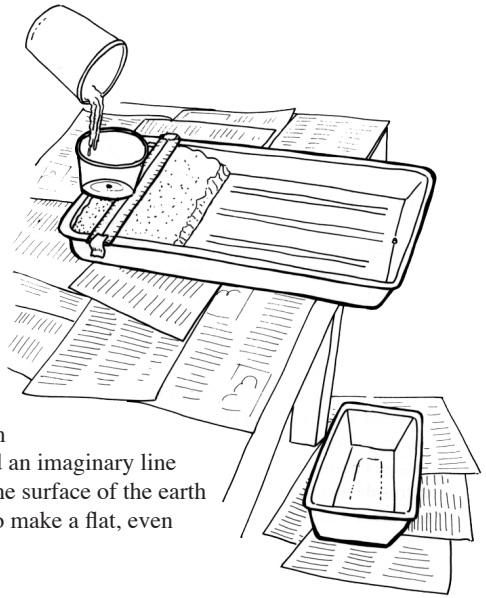
STANDARD STREAM-TABLE SETUP

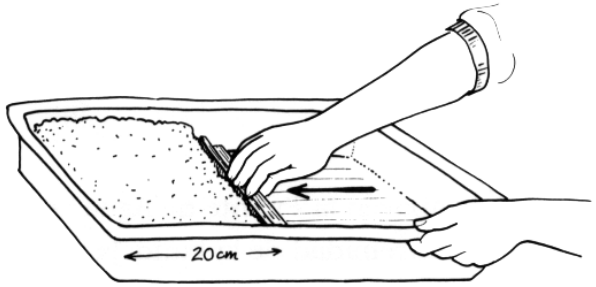
1. Cover the table with newspapers.

2. Position the plastic tray so that the end with the drain hole extends over the edge of the table.

3. Place the catch basin on newspaper on the floor under the drain hole.

4. Use the wood angle to push (bulldoze) the earth material to the end of the plastic tray away from the drain hole. Make sure it is all behind an imaginary line 20 cm from the end. Smooth the surface of the earth material with the wood angle to make a flat, even surface with a cliff-like edge.





5. Set a 30-cm ruler across the top of the tray about 6 or 7 cm from the end.

   Secure it in place with a couple of small pieces of duct tape.

6. Support the standard water source on the edge of the plastic tray and the ruler. Center it.

7. Use the 1-liter container to add water to the water source, as your teacher directs.

STANDARD STREAM-TABLE SETUP

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2. Position the plastic tray so that the end with the drain hole extends over the edge of the table.

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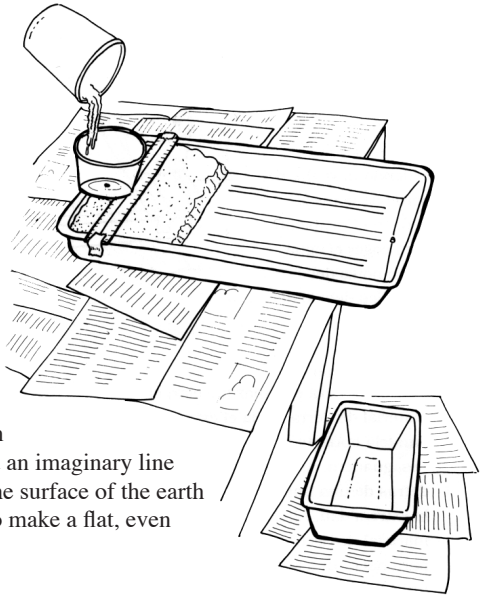

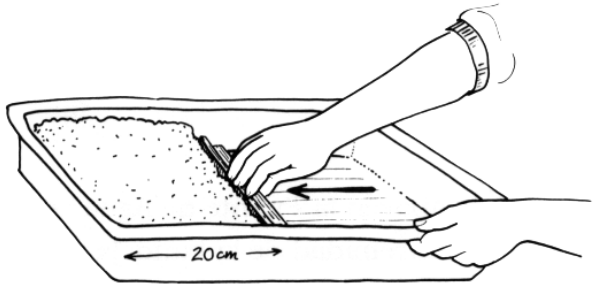

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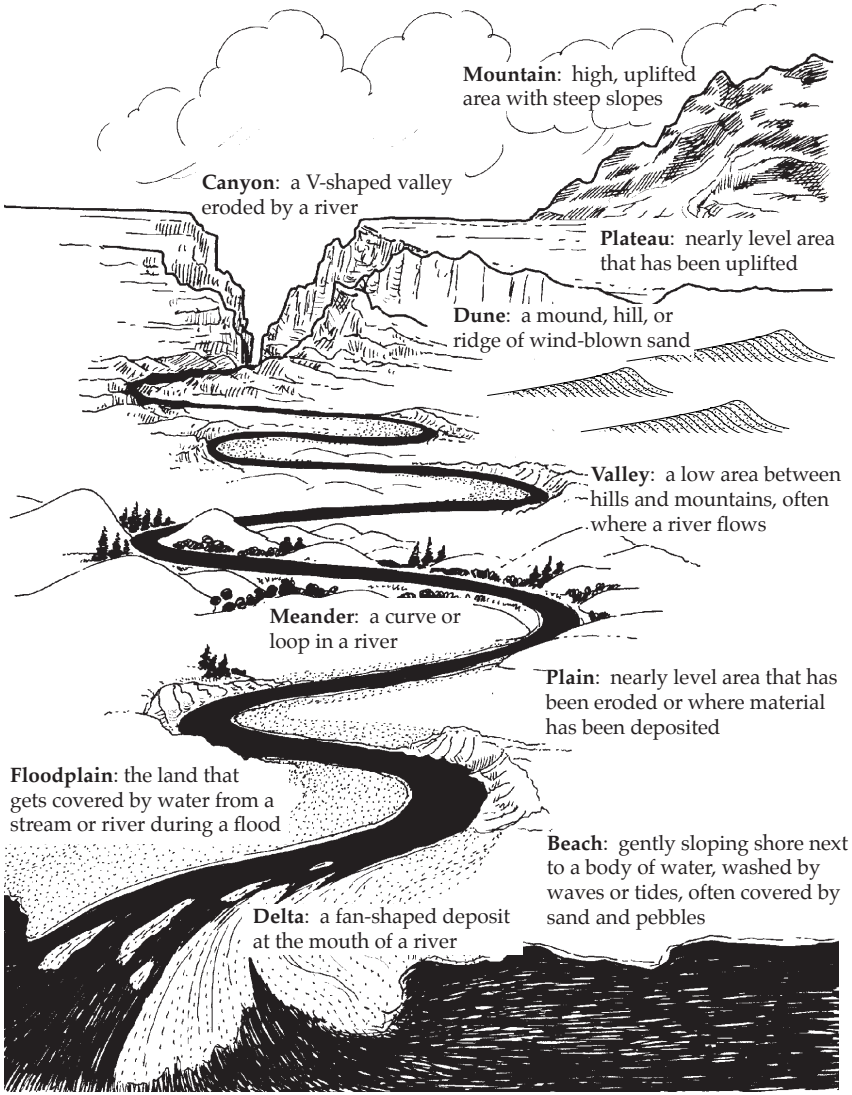
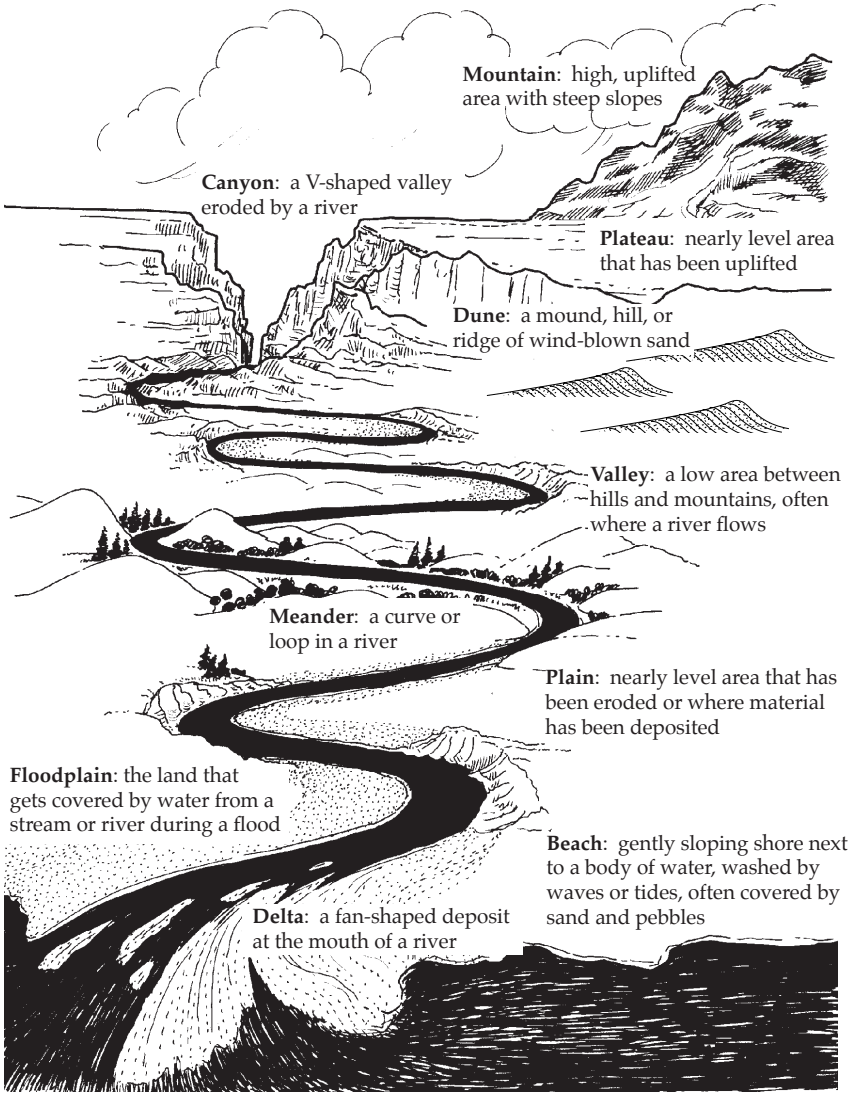
Investigation 2: Stream Tables
No. 7—Student Sheet

LANDFORM VOCABULARY



LANDFORM VOCABULARY



FOSS Landforms Module
Investigation 2: Stream Tables
No. 8—Student Sheet
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RESPONSE SHEET—STREAM TABLES

One morning on his way to school, Josh noticed a fan-shaped pile of sand covering part of the sidewalk. It wasn't there the day before, and he wondered how it got there. He made a list of clues to help him solve the mystery. These are his clues.

1. It rained really hard last night.
2. They are digging the basement for a new house on the land next to the sidewalk where I found the sand. There's a big pile of sand that they dug out.
3. When I look closely at the sand, I notice that there is some clay along the edges of the fan farthest from the basement.

What ideas do you have for how the fan of sand got on the sidewalk? Write a note to Josh describing your ideas and giving him some suggestions on where to look for more evidence.

RESPONSE SHEET—STREAM TABLES

One morning on his way to school, Josh noticed a fan-shaped pile of sand covering part of the sidewalk. It wasn't there the day before, and he wondered how it got there. He made a list of clues to help him solve the mystery. These are his clues.

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What ideas do you have for how the fan of sand got on the sidewalk? Write a note to Josh describing your ideas and giving him some suggestions on where to look for more evidence.

FOSS Landforms Module
Investigation 2: Stream Tables
No. 9—Student Sheet
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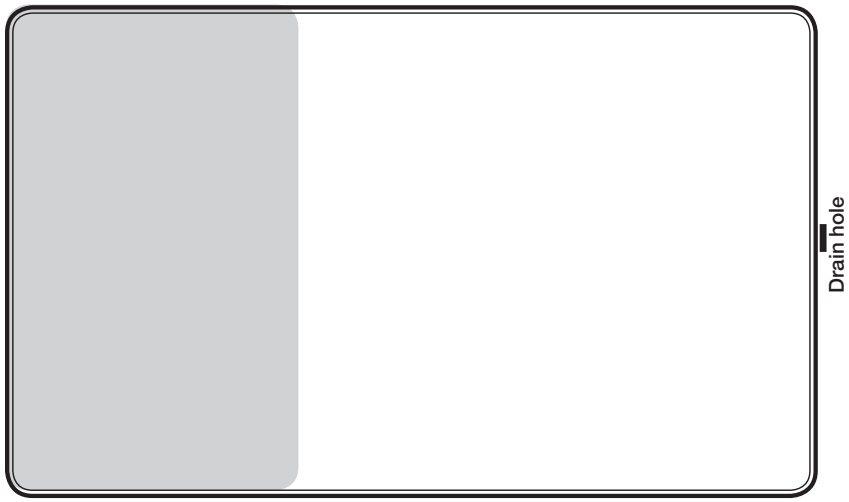
STREAM-TABLE MAP

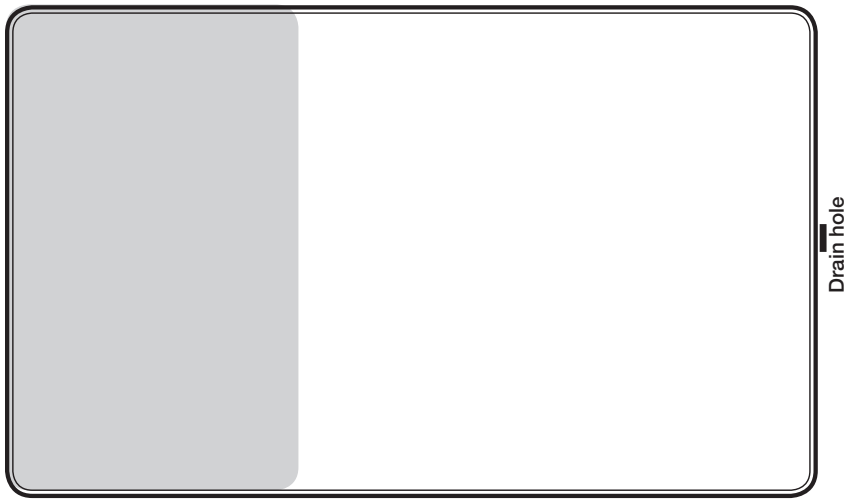
This is an investigation of _____



KEY	Elapsed time (minutes after start)	Important events
Sand/clay earth mixture		
Sand		
Clay		

STREAM-TABLE MAP

This is an investigation of _____



KEY	Elapsed time (minutes after start)	Important events
Sand/clay earth mixture		
Sand		
Clay		

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Investigation 3: Go with the Flow
No. 10—Student Sheet

RESPONSE SHEET—GO WITH THE FLOW

Allyson was very interested in the results of the investigations in the stream table. She had read about a flash flood on a river flowing through a steep canyon in Colorado several years ago. The flood caused quite a bit of damage to property and loss of lives. She wondered how she might set up an investigation in the stream table to find out what effect flooding would have on a stream with a steep slope.

What advice can you give her about setting up her investigation? How will she know what changes were caused by flooding?

RESPONSE SHEET—GO WITH THE FLOW

Allyson was very interested in the results of the investigations in the stream table. She had read about a flash flood on a river flowing through a steep canyon in Colorado several years ago. The flood caused quite a bit of damage to property and loss of lives. She wondered how she might set up an investigation in the stream table to find out what effect flooding would have on a stream with a steep slope.

What advice can you give her about setting up her investigation? How will she know what changes were caused by flooding?

FOSS Landforms Module
Investigation 3: Go with the Flow
No. 11—Student Sheet
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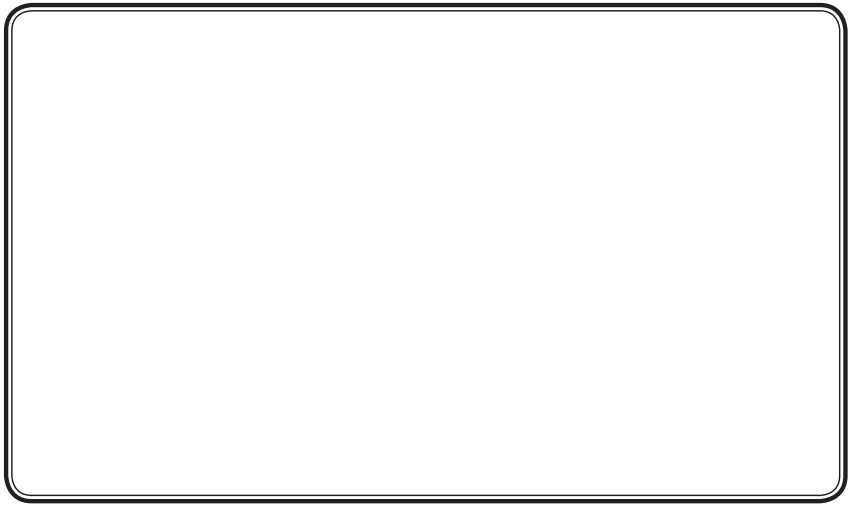
Can be duplicated for classroom or workshop use.

STREAM-TABLE PLAN

We are trying to find out what happens when

We will set up our tray like this.



We will need these materials.

STREAM-TABLE PLAN

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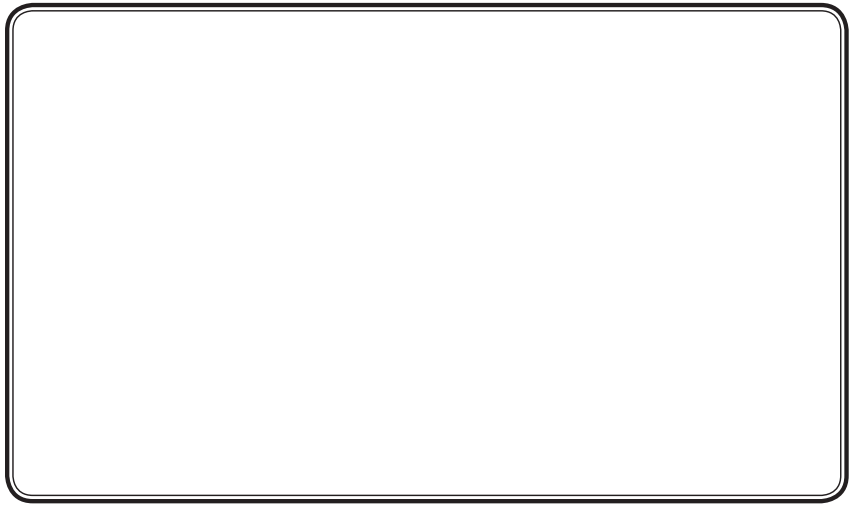
We will set up our tray like this.



We will need these materials.

FOSS Landforms Module
Investigation 3: Go with the Flow
No. 13—Student Sheet
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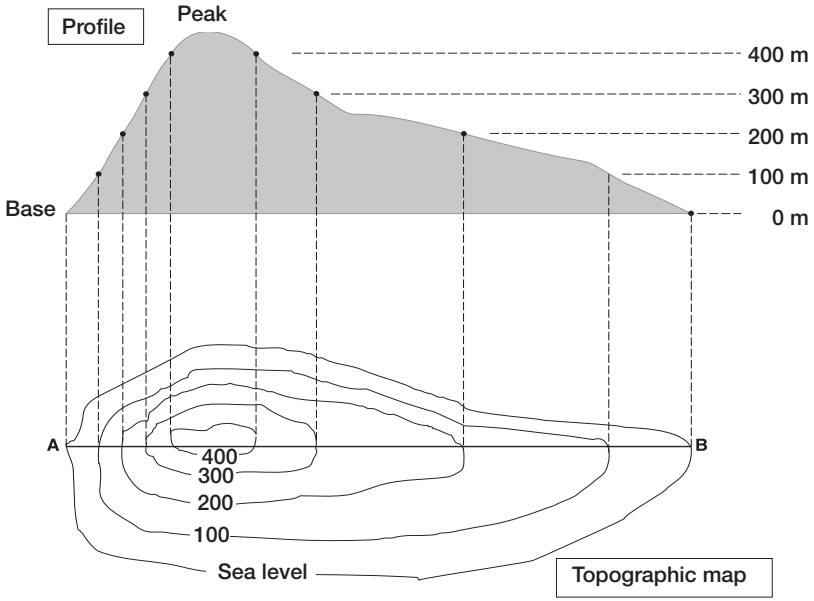
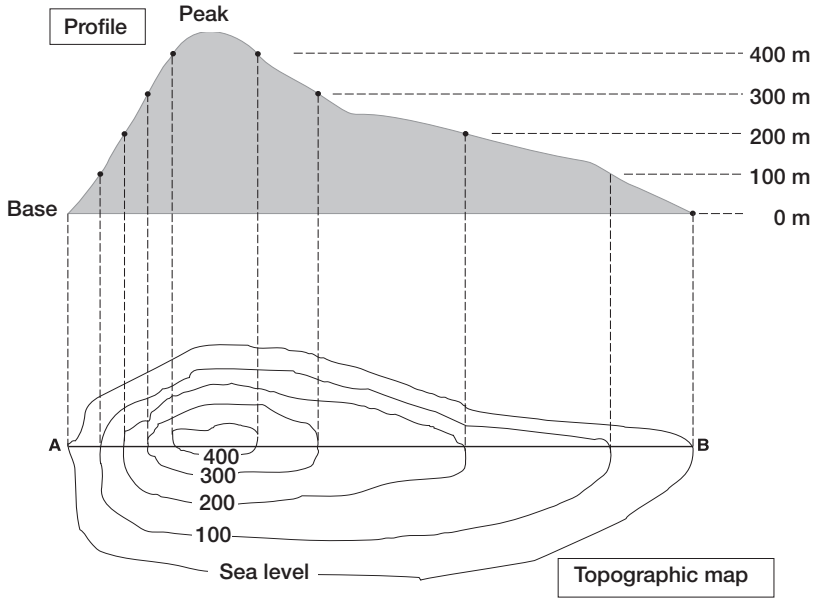
CONTOURS AND INTERVALS



The distance between contour lines on a topographic map is not always the same. But the difference in elevation between the lines, or contour interval, is always the same. The contour interval for this map is 100 m.

Contour lines that are spaced closer together represent a steeper slope. You travel the same vertical distance while traveling less horizontal distance.

CONTOURS AND INTERVALS



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Contour lines that are spaced closer together represent a steeper slope. You travel the same vertical distance while traveling less horizontal distance.

FOSS Landforms Module
Investigation 4: Build a Mountain
No. 17—Student Sheet
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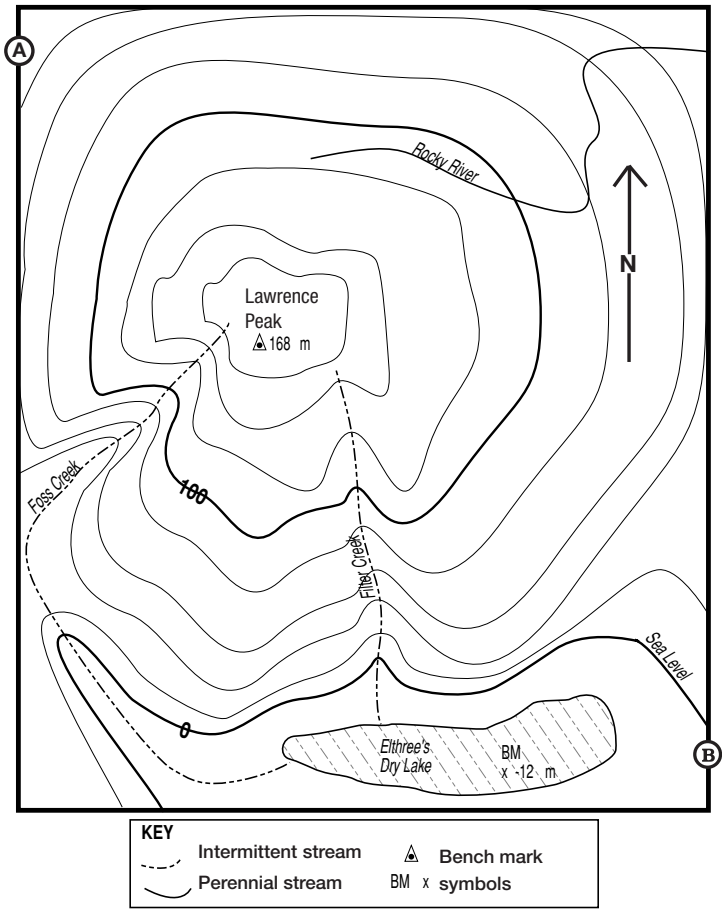
FOSS CREEK MAP

1. Label each of the contour lines with its elevation.
2. Circle the bench mark with the lowest elevation.
3. Put a square around the bench mark with the highest elevation.
4. Draw an arrow to show the direction the water flows in Rocky River.
5. What is the contour interval used on this map?

   _____

6. Draw a trail that's not very steep that you would use to walk from Elthree's Dry Lake to Lawrence Peak.



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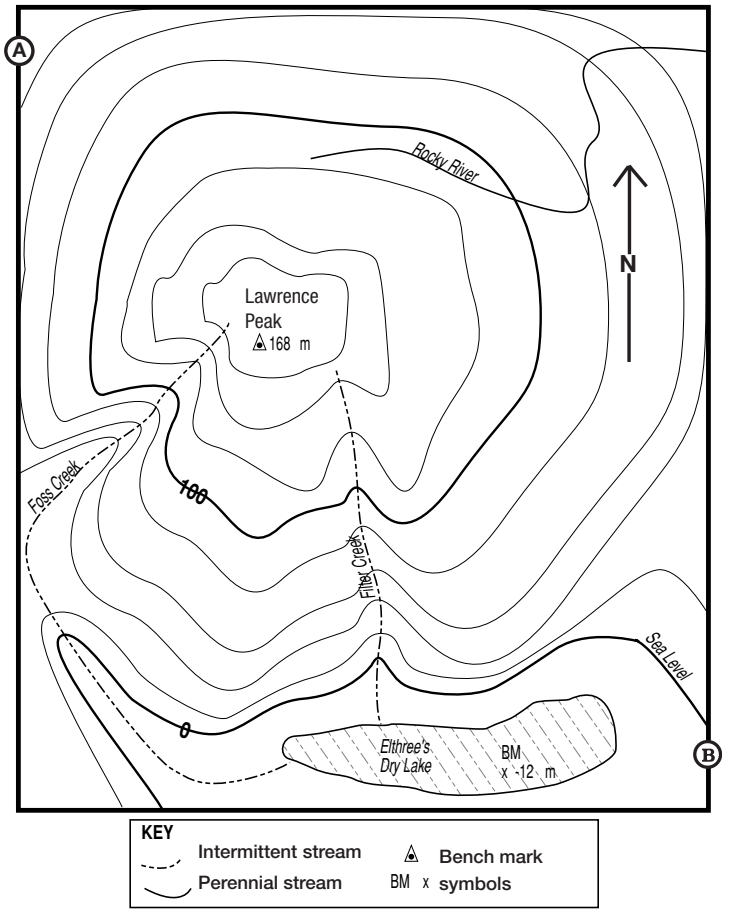

FOSS Landforms Module
Investigation 4: Build a Mountain
No. 18—Student Sheet
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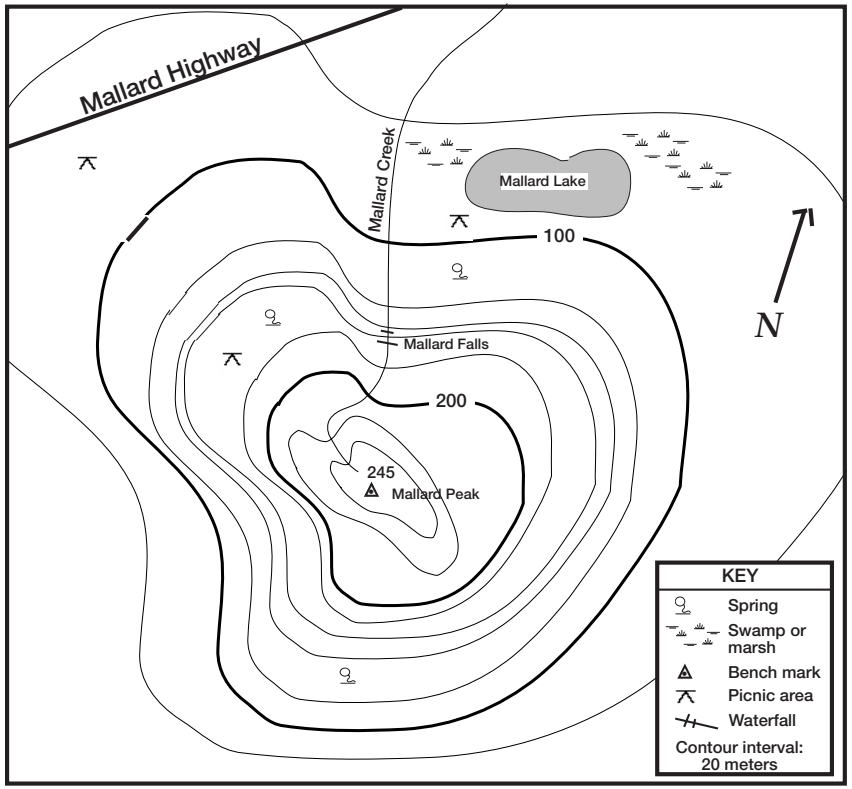
RESPONSE SHEET—BUILD A MOUNTAIN

William and his uncle were planning a hike to Mallard Peak, a landform in a nearby park. His uncle had a topographic map for the area and was trying to plan the best route to the peak. They didn't mind climbing up steeper slopes and wanted to see some nice scenery, like waterfalls. William also thought it might be easier for them to walk down a less steep slope at the end of the day.

Draw a trail on the map that you would suggest that William take to get to the top of Mallard Peak and back again. Label the start and end points. Use arrows to show the direction he should hike. Explain why you think your route would be the best one.



Write in your science notebook.

RESPONSE SHEET—BUILD A MOUNTAIN

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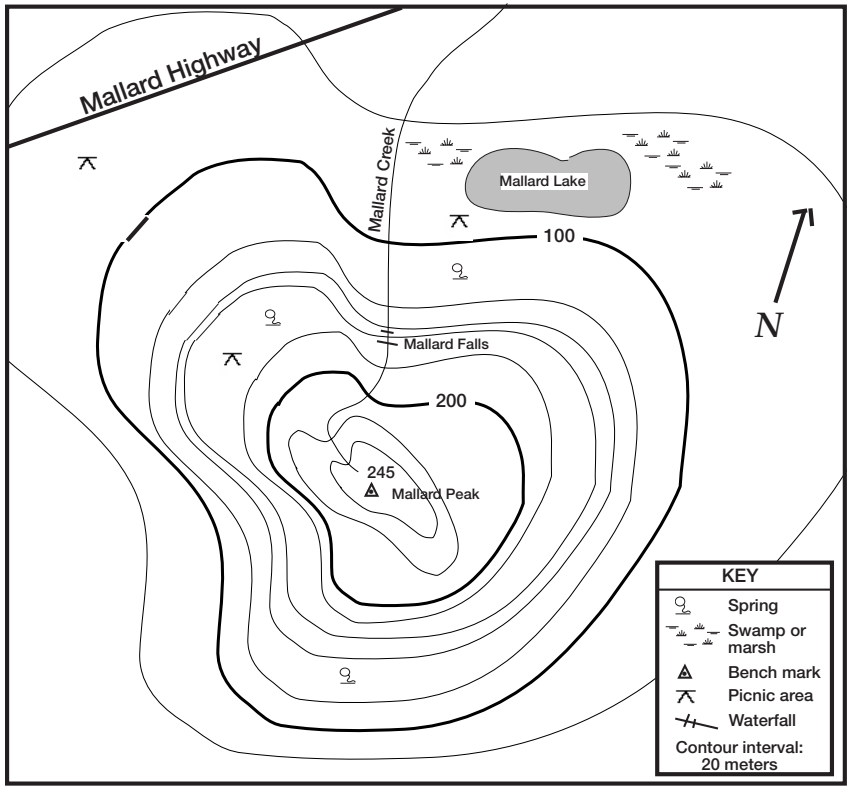

Write in your science notebook.

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Investigation 4: Build a Mountain
No. 19—Student Sheet

TOPOGRAPHIC-MAP SYMBOLS

Bench marks 

National boundary

Park, reservation, or monument

Primary highway

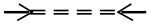
Secondary highway

Light duty road

Unimproved road

Trail

Bridge

Tunnel 

Dwellings 

Airport 

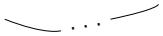
Water tank; small, large 

Campground; picnic area 

Railroad track

Levee

Water well; spring or seep 

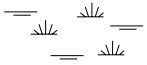
Intermittent stream 

Falls or rapids 

Dam 

Glacier 

Dry lake

Swamp or marsh 

Quarry or open mine pit 

Gravel, sand, clay or borrow pit 

TOPOGRAPHIC-MAP SYMBOLS

Bench marks 

National boundary

Park, reservation, or monument

Primary highway

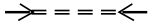
Secondary highway

Light duty road

Unimproved road

Trail

Bridge

Tunnel 

Dwellings 

Airport 

Water tank; small, large 

Campground; picnic area 

Railroad track

Levee

Water well; spring or seep

Intermittent stream

Falls or rapids

Dam

Glacier

Dry lake

Swamp or marsh

Quarry or open mine pit

Gravel, sand, clay or borrow pit

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Investigation 5: Bird's-Eye View
No. 20—Student Sheet

MT. SHASTA QUESTIONS

Use the aerial photograph and topographic map of Mt. Shasta to answer the following questions.

1. Describe two landforms you see in the aerial photograph.

2. Describe two human-made features you see in the aerial photograph.

3. What do you think the white areas are on the top of Mt. Shasta?

4. Find the landform called Shastina. What is its elevation?
   _____

5. Find Inconstance Creek. Which direction does it flow?
   _____

6. Find Whitney Glacier. Write down the names for two other landforms near the glacier's highest point.

7. Find North Gate. What is its elevation? _____

8. Find the following landforms on both the map and aerial photograph. Give the name of the feature if it is available or the name of a nearby feature.

a. Spring _____

b. Lake _____

c. Mountain ridge _____

d. Lava flow _____

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a. Spring _____

b. Lake _____

c. Mountain ridge _____

d. Lava flow _____

FOSS Landforms Module
Investigation 5: Bird's-Eye View
No. 21—Student Sheet
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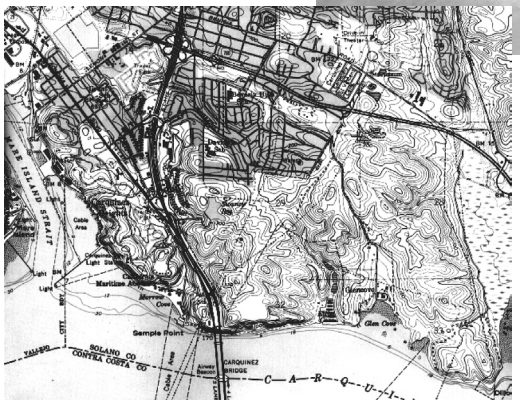
RESPONSE SHEET—BIRD'S-EYE VIEW

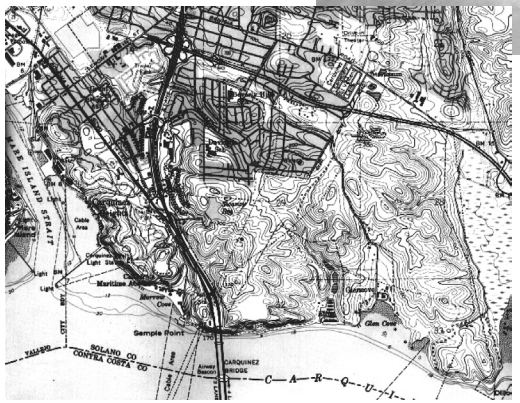


Ben is a student representative working with the city planning commission to plan a bike trail around his community. Last week he visited the U.S. Geological Survey's map center with his aunt. While he was there, he found a topographic map of the area where he lived. He also found an aerial photograph of the same area. He only had enough money to buy either the topographic map or the photograph, but he couldn't get both.

If you were Ben, which would you buy if you wanted the one that would give you the most information for planning the bike trail? Explain why you chose the one you did.

On the aerial photograph and the topographic map shown on this sheet, identify three common structures or landforms. Circle each on the map and photo and give them matching numbers to identify them as the same.

RESPONSE SHEET—BIRD'S-EYE VIEW



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On the aerial photograph and the topographic map shown on this sheet, identify three common structures or landforms. Circle each on the map and photo and give them matching numbers to identify them as the same.

FOSS Landforms Module
Investigation 5: Bird's-Eye View
No. 22—Student Sheet
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DEATH VALLEY QUESTIONS

Use the aerial photograph and topographic map of Death Valley to answer the following questions.

1. What is the scale of the map, expressed as a representative fraction?
   _____

2. Describe two landforms you see in the aerial photograph.

3 Describe any human-made features you see in the aerial photograph.

4. What do you think the white areas are in the Death Valley photograph?

5. Find and record the elevations of these features and landforms on the Death Valley/Furnace Creek map.

   a. Devil's Speedway _____ c. Salt Creek _____

   b. Sea level _____ d. Lowest elevation in U.S. _____

6. Find examples of the following landforms or features on either the map or the aerial photograph. Give the name of the feature if it is available or the name of a nearby feature.

   a. Intermittent lake _____

   b. Erosion _____

   c. Deposition _____

   d. Alluvial fan _____

7. Describe the shape of the contour lines that represent an alluvial fan on the map.

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7. Describe the shape of the contour lines that represent an alluvial fan on the map.

FOSS Landforms Module
Investigation 5: Bird's-Eye View
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No. 23—Student Sheet

GRAND CANYON QUESTIONS

Use the aerial photograph and topographic map of the Grand Canyon to answer the following questions.

1. What is the scale of the map, expressed as a representative fraction?
   _____

2. Describe two landforms you see in the aerial photograph.

3. Describe two human-made features you see in the aerial photograph.

4. What do you think the black areas are in the Grand Canyon photograph?

5. Find the following features and landforms on the Bright Angel topographic map and/or the aerial photograph. Record the elevation of each place.

   a. Yaki Point _____ c. The Dragon _____
   b. Yavapai Point _____ d. North Rim Ranger Station _____

6. Which general direction do each of the following rivers and creeks flow (e.g. north, south)?

   a. Colorado River _____ c. Cremation Creek _____
   b. Bright Angel Creek _____ d. Hermit Creek _____

7. Does the Atchison, Topeka, and Santa Fe Railroad travel uphill or downhill to get to the El Tovar Hotel on the South Rim of the Grand Canyon? How do you know?

8. Which trail travels down the most in elevation before reaching the Colorado River, the Bright Angel Trail starting from Grand Canyon Village on the South Rim or the Kaibab Trail starting from the ranger station on the North Rim? How do you know?

GRAND CANYON QUESTIONS

Use the aerial photograph and topographic map of the Grand Canyon to answer the following questions.

1. What is the scale of the map, expressed as a representative fraction?
   _____

2. Describe two landforms you see in the aerial photograph.

3. Describe two human-made features you see in the aerial photograph.

4. What do you think the black areas are in the Grand Canyon photograph?

5. Find the following features and landforms on the Bright Angel topographic map and/or the aerial photograph. Record the elevation of each place.

   a. Yaki Point _____ c. The Dragon _____
   b. Yavapai Point _____ d. North Rim Ranger Station _____

6. Which general direction do each of the following rivers and creeks flow (e.g. north, south)?

   a. Colorado River _____ c. Cremation Creek _____
   b. Bright Angel Creek _____ d. Hermit Creek _____

7. Does the Atchison, Topeka, and Santa Fe Railroad travel uphill or downhill to get to the El Tovar Hotel on the South Rim of the Grand Canyon? How do you know?

8. Which trail travels down the most in elevation before reaching the Colorado River, the Bright Angel Trail starting from Grand Canyon Village on the South Rim or the Kaibab Trail starting from the ranger station on the North Rim? How do you know?

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FOSS LANDFORMS MODULE

PROJECT PROPOSAL

1. What is the question or the project that you are proposing?

2. What materials or references will you need to complete the project?

3. What steps do you need to take to complete the project?

FOSS LANDFORMS MODULE

PROJECT PROPOSAL

1. What is the question or the project that you are proposing?

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