GEOLOGY HAS A MAJOR ROLE, from global to local scales, in the well-being of our society. The image below shows an aerial photograph superimposed on topography for an area near St. George, Utah. In this investigation, you will identify some important geologic processes operating in this region and think about how geology affects the people who live here.

**Goals of This Exercise:**
- Determine where important geologic processes are occurring.
- Interpret how geology is affecting the people who live here.
- Identify a relatively safe place to live that is away from geologic hazards.

Begin by reading the procedures list on the next page. Then examine the figure and read the descriptions flanking the figure.

1. Most of this region receives only a small amount of rain and is fairly dry. The low areas are part of a desert that has little vegetation and that is hot during the summer. The dry climate, coupled with erosion, provides dramatic exposures of the various rocks. People living here rely on water from wells, reservoirs, and the rivers that flow into the area from distant mountains that receive more rain and snow than this low, dry area.

2. A high, pine-covered mountain range and steep, rocky cliffs flank the valley. The cliffs and mountains receive abundant winter snow and torrential summer rains, which cause flash flooding down canyons that lead into the valley. This photograph (▼) shows the valley, mountains, and cliffs, viewed toward the northwest. The high mountains in the photograph are outside of the area shown in the main figure.

3. This figure exaggerates the height of the land surface to better show the features. It shows the mountains twice as high and twice as steep as they really are. Exaggerating the topography in this way is called vertical exaggeration.

4. The Virgin River receives water from precipitation in mountains around Zion National Park. It enters the valley through a narrow gorge. Hot springs at the end of the gorge, where the river flows through the cliffs, provide recreation.
Procedure:

Use the figure and descriptions to complete the following steps. Record your answers in the worksheet, which will be provided by your instructor in paper form, as a printable file, or as an activity you complete online.

1. Using the image below, explore this landscape. Make observations about the land and the geologic processes implied by the landscape. Next, mark on the provided worksheet at least one location where the following geologic processes would likely occur: weathering, erosion, transport of sediment, deposition, formation of igneous rock, flooding, and landsliding.

2. Using your observations and interpretations, indicate on the worksheet all the ways that geology might influence the lives of the people who live here. Think about each landscape feature and geologic process, and then decide whether it has an important influence on the people. Where would you look for water? Is there a higher potential for a certain type of natural hazard (flooding, earthquakes, etc.) in a particular part of the area?

3. Using all your information, select a location away from geologic hazards that would be a relatively safe place to live compared to more hazardous sites in the area. Mark this location on your worksheet with the word Here.

5. Several dark, lumpy hills are volcanoes that have erupted in the recent geologic past (last several million years). When the volcanoes erupted, they poured molten rock (lava) onto the surface and launched hot volcanic projectiles into the air.

6. The Hurricane Cliffs mark the location of the Hurricane fault, a huge crack through the crust. Movement along this fault uplifted rocks on the east side, forming the cliffs. The fault has been active recently, causing a few small and moderate-sized earthquakes.

7. Along the valley, the rock layers are warped upward like a bunched-up rug. Petroleum formed when organic-rich layers were buried and slightly heated, liberating the oil. The oil rose until it became trapped within the rock layers at depth. It is pumped to the surface in a nearby oil field that is not on the map but is in a geologic setting similar to the area labeled here as an oil field.

8. Early pioneers and more recent inhabitants sited farms next to the river because there is a supply of freshwater and because floodwaters deposit mud that replenishes the fertile soils. The river occasionally overflows its banks, flooding the farms and other low areas, so most houses are away from the river or on areas that are high enough to avoid most floods. Farms were placed next to the rivers, and towns were built near the farms.