Teacher Notes (these notes are also available for download in the Related Items section below)

This resource is a compilation of text, videos, and other elements to create a scaffolded 5E learning experience for students. This is meant for Tier I instruction under the Response to Intervention (RtI) model for grade 8 science TEKS 8.9C.

Be sure to review the entire resource and the related items before assigning it to, or working through it with, your students to check for prerequisite knowledge and skills as well as differentiation needs.

This resource can be used for instruction in a variety of ways.

• Use with a single computer and projector; this can be delivered in a traditional classroom.

• Use with a combination of teacher computer/projector and individual student computers (in either a computer lab or other 1:1 environment).

• Assign to students as work to do outside of the school day as part of a "flipped classroom" to allow for application, practice, and additional support during the school day.

• Use with students as tutorials.

• Share with parents to inform them about what their child is learning in school.

• Use with students who are unable to participate in the traditional classroom environment.

Engage:

Students observe the Mars map and answer the questions provided. This is an inquiry based activity that helps students become familiar with the topography of Mars. The questions are based mainly on observing patterns. Based on the students' prior knowledge, you can increase the difficulty of the questions to suit your classroom.

Classroom Options

Provide the class, groups of students, or each student a Mars map. Have them first brainstorm and list general observations about the map in their science notebook. Then provide the questions and have students answer in their notebooks. Discuss students' findings and thoughts about the topography that they observed.

Explore I:

Students have the opportunity to explore topographic maps by creating a three-dimensional model from a two-dimensional map. The map provided is from Angel Island in San Francisco Bay, California, but any map that fits inside the plastic trays is acceptable. By creating the three- dimensional model themselves, students can see the elevations that a flat map represents in real life.

Classroom Options

Administer copies of the Angel Island (or another preferred) map to groups of 2-3 students. Ask them to observe the contour lines and discuss the topography of the landform. The presentation allows a step by step procedure that can be easily followed as the students move through the activity. Any plastic food trays/lids work fine, as long as they stack together. Depending on the map, the number of lids used can be adjusted. Sharpies work best and will not smudge, however using a dry erase or overhead marker allows for recycling of the lids! Students can record observations and check for understanding by completing the Maps to Models Student Sheet. At the conclusion of the activity, discuss the connections between the map and the three-dimensional model created.

Explain I:

This section of the resource provides students with a summary of what they discovered in Explore I. The important part of this section is the important terms and visual examples.

Classroom Options

The presentation can be used in different ways depending on the needs of the students. It can be used "as is" and paused when needed. Have students complete the Going Up! Student Sheet while going through the presentation. For higher level learners, the presentation slides can also be printed and given as a gallery walk- students can use the student sheet and complete it while visiting the information placed around the classroom. The power point only presentation can be found in the Related Items section. At the conclusion of the gallery walk, students can discuss findings and make connections. With struggling learners, teachers may choose to create their own student sheet and go through the presentation at their own pace, possibly highlighting important information for the students.

Explore II:

Students have the opportunity to make their own clay landform and then create a topographic map to represent it. It reinforces the Explore I activity by again showing how a three-dimensional model is represented on a flat map.

Classroom Options

In a classroom setting, this activity is ideal with students working in groups of two. The presentation allows a step by step procedure that can be easily followed as the students move through the activity. Play-Doh® works very well, but soft modeling clay or homemade Play-Dough is also an option. Dental floss is perfect for cutting through the clay, but fishing line is another alternative.

Distribute enough clay for students to mold a landform they can work with. Students should create a landform that shows elevation, steep or gentle slopes, a valley or a depression. Depending on the class, all groups can make the same landform, just different versions.

Once all of the landforms are sliced and the topographic maps are created, the students should complete the Play-Dough Topo Student Sheet. Another way to further students' learning is to have a gallery walk. The students walk around and observe the other group's landforms and matching

topographic map to see the correlation. For higher learners, separate the landform from its topographic map. Mix them up and have students try to correctly pair the map with the clay landform based on their knowledge of elevation and topography. Discuss with students the future of each land feature- what will it look like as time passes (due to erosion/weathering/catastrophic event)? How will this change the contour lines on the map?

Explain II:

This section of the resource provides students with a summary of what they discovered in Explore II. The important part of this section is the important terms and visual examples. This presentation further explains topography, but now discusses satellite views to identify land and how it may be reshaped by weathering.

Classroom Options

The presentation can be used in different ways depending on the needs of the students. It can be used "as is" and paused when needed. For higher level learners, the presentation slides can also be printed and given as a gallery walk- students can use the student sheet and complete it while visiting the information placed around the classroom. The power point only presentation can be found in the Related Items section. At the conclusion of the gallery walk, students can discuss findings and make connections. With struggling learners, teachers may choose to create their own student sheet and go through the presentation at their own pace, possibly highlighting important information for the students. Students can also be given sets of cards and use them to match the satellite with the landform view.

Elaborate:

This activity further reinforces the skills needed to interpret topographic maps and satellite images. Students use the website to visit different locations, observe the elevation, and answer questions.

Classroom Options

The Reading Topographic Skills and Satellite Maps Student Sheet can be downloaded from the Related Items section. The student sheet lists the directions step by step in order to access and navigate through the website successfully. Teachers may use the program "as is" or change the locations that the students will visit. If so, the analysis questions may need to be adjusted as well. Another option is to give students an extra quest at the end to choose their own location and create their own topography questions. Then they switch with a partner and work on each other's analysis questions.

Evaluate

This quiz is available to quickly assess students on the concepts covered in the resource. Students can print their results using the "Print Screen" feature on the computer and then paste that into a document. This document could be e-mailed to the teacher or printed out to hand in. Teachers may also choose to include a more detailed assessment of their own.