Nine Square Puzzle

TEKS Science: 8(D)
Social Studies: 5.6(A), 5.7(B,D), 5.9(B)
 Reading: Students learn academic vocabulary in meaningful context, and 5.27, 5.29

AISD Essential Science Vocabulary
basin, pollution, flow, layer

Concept
Water quality impacts found in the City of Austin.

Objective - Students will:
1) use "Who Am I" clues and the Nine Square Model of Austin to identify water quality impacts;
2) build the Austin model matching topographical and underground rock features;
3) locate the recharge zone on the model;
4) locate the area on the model where the students' school would be located; and
5) use the model to identify possible water quality impacts in the students' neighborhood.

Time   30 minutes

Materials: Provided at the Green Classroom
- Nine square models with felt covers
- Vocabulary cards with "Who Am I" clue on the back
- Sticky tack

Preparation: Provided by the Earth Camp Assistant
1. Place square #5 on a demonstration table for instruction.
2. Place the other watershed squares around the table.
3. Match vocabulary cards (by number) to the number on each square.
4. Cover each cube with a felt cover.

GREEN CLASSROOM LESSON
Austin Nine Square Model

Introduction

Take the cover off square #5 and allow the students a minute to discover. Show students one of the vocabulary cards. Read the "Who Am I" clue on the back of the card. Ask students to locate the item on the card in the cube. Stick the vocabulary card on the model in the correct location. Continue this procedure to complete square #5.

Procedure

1. **Student Directions**
    - Each square has vocabulary cards that name something found in the model. For a definition, read the "Who Am I" clue written on the back of each card.
    - When an item is located, stick the card on the model to label.
    - When finished, raise your hand for the teacher to check answers.
    - Work with a partner (two to a square).
2. **Managing the Activity**
    - Tell students to take the cover off one square and begin.
    - When students are finished, check their work.
    - Ask students to remove the vocabulary cards and put them back in the bag, then choose another square.
    - Continue until students have completed most of the squares.
3. **Connecting the Austin Watershed Puzzle**
    (DO NOT ALLOW STUDENTS TO CARRY THE CUBES OR BUMP THEM WHEN SLIDING THEM AROUND.)
    - Place square #5 in the center of the models. Tell students this is the model of central Austin. All the other squares connect to #5 to form north, south, east, and west Austin. There are only 3 squares connected in each direction. The land surface (roads, railroad tracks, etc.) are clues for connecting squares, as well as the underground rock layers.
    - Tell students they may carefully slide the models around until they find a match.
4. **Discussing the Results**
    - Ask students to look at the model at eye-level. Ask students to identify the Edwards Limestone (the layer with the caves and openings).
    - Ask students to locate the area on the model where the Edwards Limestone is located on the surface. This is the Recharge Zone. Identify a Recharge Zone (the area of land where water can flow down into the aquifer).
    - Ask students to look at the surface of the model and identify some landmarks that are located on the Recharge Zone. (MoPac is the dividing line for the beginning of the Recharge Zone, which continues west. Barton Creek is over the Recharge Zone.)

- Discuss possible sources of <mark>pollution</mark> located over the Recharge Zone that could <mark>flow</mark> into the aquifer.
- Point out Barton Springs.
- Ask student to identify the area where their school is located (actual school buildings are not represented on the model). Discuss possible sources of <mark>pollution</mark> located in their neighborhood that could <mark>flow</mark> into the creek and eventually into the Colorado River <mark>Basin</mark>. All the land in the model eventually drains into the Colorado River <mark>Basin</mark>.

5. **Cleaning Up**
   - Ask students to mix the squares around, place covers back on, and put vocabulary cards with the correct square.