

## Phosphate Mining Video

### Reinforcement Activity: Paper Manipulative

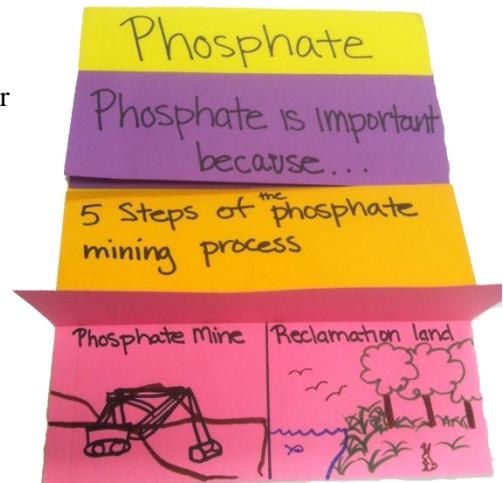
- This paper manipulative is a useful introduction activity for the Nutrients for Life phosphate mining video. The paper manipulative enforces concepts learned in the phosphate mining video; such as why phosphate is important, steps of the phosphate mining process, and visual identifiers of reclamation land. Students can easily review video concepts with the manipulative.

#### Materials Needed:

- Construction paper (4 colors)
- Scissors
- Markers
- Glue sticks or tape

#### Directions:

1. *Before students view the phosphate mining video:* Each student will need three 6-inch strips of construction paper and one 8 ½ x 11-inch piece of construction paper.
2. Students should fold the three strips of paper in half and glue them on to the 8 ½ x 11-inch paper as shown:
3. Students should label on top of the paper strips:
  - a. Phosphate is important because...
  - b. 5 Steps of the Phosphate Mining Process
  - c. Reclamation
4. *After students view the phosphate mining video:* Students should answer #3 a, b, and c inside the folded strips. Sample answers may include:
  - a. Phosphate is important because...
    - i. It feeds the world!
    - ii. It is a natural resource.
    - iii. It is one of 17 nutrients that help plants grow.



b. 5 Steps of the Phosphate Mining Process

- i. Enormous machines called draglines carve phosphate rock out of the mine.
- ii. The matrix, consisting of sand, clay and phosphate, is hydro-blasted and then pumped into the processing plant.
- iii. At the plant, the matrix is separated and transported.
- iv. Phosphate rock is ground into powder and mixed with water.
- v. Next, it is pumped to another area of the processing plant, where it reacts with sulfuric acid to form phosphoric acid. Finally, the fertilizer plant combines the phosphoric acid with anhydrous ammonia to produce fertilizer.

c. Reclamation

- i. Review the dragline section of phosphate video (minute 3:15 – 4:05) and then pause on a shot of a dragline. Instruct students to sketch a dragline and phosphate mine on one side of the inner strip of paper.
- ii. Review the reclamation land section of the phosphate video (minute 4:45-5:10) and then pause on a shot of reclamation land. Instruct students to sketch reclamation land.