

# LESSON PLAN FOR SIMULATING SURFACE MINING AND RECLAMATION IN KENTUCKY USING CHOCOLATE CHIP COOKIES

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## **Teacher Preparation:**

- Teacher will need to have all listed materials ready and in place before class begins.
- Put the expectation(s) or learning goal(s) for today's lesson on the board or in a prominent location for the students to view.
- If the cookie mining materials are out on the student's tables/desks, the teacher may need to ask students not to bother these until given direction to do so. It will depend on your usual classroom rules/routine. Re-check the materials between class changes to replace depleted supplies or have the previous class do this re-stock during the clean-up stage.
- Put up large sheets of chart paper, butcher paper, or bulletin board paper throughout the class room to allow the students to move around freely without bunching up if the classroom arrangement allows for this. One of the following questions needs to be written on each sheet.
  1. What does the word reclamation mean in reference to coal mining?
  2. Are you aware of the reclamation efforts in Kentucky by the coal mining industry?
  3. Have you ever observed a surface or strip mining operation of any type?  
(This can be any place in the USA)
  4. Name one type of mining process you have seen or observed. This can include non-working mining operations.
  5. Do you have a family member who is presently working in a type of mining operation or who has worked in a mining operation?
  6. Do you presently have family or friends who live in an active mining area or region?
- Have post-it-notes available on the desks or tables for the students to have easy access to them.
- This activity with the post-it-notes and poster paper will take 3-4 minutes for the students doing the activity itself. Allow another 1 minute for directions and questions. It takes about 2 minutes for the six students to arrange the post-it-notes after the activity. Allow a total of 10-15 minutes total, including the chart paper discussion of the results.

## **PROCEDURE FOR BELL RINGER/QOD/INTRODUCTION TO THE LESSON/ENGAGING THE STUDENTS:**

- If the students are accustomed to coming into the classroom and completing a bell ringer/QOD then this activity can be started once they enter the classroom and set down their books. If the teacher does not have a daily activity for students to begin once they come into class, then they will need to give directions for this intro activity.
- This is the procedure for teachers who have bell ringers/QODs. Write on the board as the bell ringer or QOD: *Take a pad of post-it-notes and a writing tool with as you go around and answer the questions on the large sheets of paper I have placed around the room. Once you answer the question on a post-it-note you need to place the post it note on the paper and move on to another question. You do not need to do the questions in order and you need to avoid bunching up in one area. Do not discuss the questions with your classmates. Do not read responses of other students. Do not write your name on the post-it-notes. Once you have finished, return to your seat and fill in your bell work/QOD by listing today's activity as coal mining questions.*
- This procedure is for teachers who do not have a set routine of bell work/QODs. Once the students are in class and you are ready to start give the following directions orally or have them on the projector/overhead/board for them to read silently.
- *The directions for the students are:* Take a pad of post-it-notes and a writing tool with as you go around the and answer the questions on the large sheets of paper I have placed around the room. Once you answer the question on a post-it-note, you need to place the post it note on the chart paper and then move on to another question. You do not need to do the questions in order and you need to avoid bunching up in one area. Do not discuss the questions with your classmates. Do not read responses of other students. Do not write your name on the post-it-notes. You will have about 5-6 minutes to complete this task. Once you have finished return to your seat and prepare for discussion of the questions on the chart paper. Are there any questions?
- Tell the students to start once you have answered questions.
- Give the students a one minute warning at the appropriate time if necessary.
- Once everyone is seated assign one student per sheet of poster paper to go to that paper with a marker. They are to arrange the post-it-notes based on the responses given. Then they are to write the total for each section's responses. Tell these six students they need to decide how to arrange the post-it-notes in an organized manner on the paper for their question. They are to write the totals on the paper for each section of responses. If they have problems they may ask one of the other people working on a poster for help.
- While the six students organize the post-it-notes, the teacher will ask the remaining students:
  1. What do you think the main topic of these six questions were about? (coal)
  2. Who can give us a definition of strip mining?

3. Who can give us a definition of reclamation in regard to strip mining?
  4. We are going to predict how much the class already knows about reclamation of strip mining/surface mining. You can only vote once. How many of you think  $\frac{1}{2}$  or 50% of the class knows about reclamation? (teacher should write this on the board as the vote is taken) How many of you think  $\frac{3}{4}$  or 75% of the class knows about reclamation? How many of you think less than  $\frac{1}{4}$  or 25% of the class knows about reclamation?
  5. Who can tell the class what black lung is and how it is related to coal mining? (black lung is the name given to a man made disease that causes the lungs to become unable to expand and contract instead of being flexible like a balloon. The person has trouble breathing because the lungs will not expand and contract. This in turn puts strain on the heart. It is related to coal mining because the coal dust that is inhaled into the lungs and the body cannot expel or absorb it into the body. It can be avoided by not breathing the coal dust over a long period of time. There is no cure except for not being exposed to the coal dust.)
  6. Is black lung associated more with underground mining or surface mining? (both)
- The six students should be done by this time.
  - Teacher would go to each sheet and read the question. Give the results that have been written by the student helper. The arrangement of the post-it-notes should also serve as a visual for everyone in the class to see.
  - Once the teacher has gone over each of the six questions, then refer to the learning goal or expectation of learning you have listed for today. Ask how these poster sheet questions relate to the goal or expectation.
  - Transition the class to the Cookie Mining Activity.
  - Refer to the Simulating Surface Mining and Reclamation in Kentucky using Chocolate Chip Cookies Teacher Directions.
  - Once the worksheet for the Cookie Mining has been collected the teacher will have the students complete an exit slip. The questions for the exit slip can be completed in several ways. The students could respond to the exit questions in their science journals/logs or on a half sheet of horizontally torn paper. This would allow two students to share one sheet of paper and conserve paper. The teacher could have the question(s) prepared on a word document and then put it on the projection screen, write the question(s) on the board, or give the question(s) orally.
  - The exit slip questions are listed on the template of this overall lesson for the teacher to select from or to develop their own question(s).
  - The slips or journal/notebook entries should be completed before the student leaves and given to the teacher before exiting the class.