**Station #1 – DUNE MOVEMENT**

***Materials****: Paper bag, box, hair dryer, marker, mask, ruler, sand*

***Introduction****: Wind moves the sand by a process called saltation. The sand skips and bounces along the ground in the same direction as the wind is blowing. As sand is blown across a beach, the dunes change. In this activity, you will investigate the effect wind has on a model sand dune..*

***Procedure****:*

1. Brush the sand in the box into a dune shape about 10 cm from the end of the box.

2. Use the lines drawn along the edge of the box to measure the location of the dune’s peak to the nearest centimeter.

3. Put on your safety goggles and mask. Hold the hair dryer so that it is level with the peak of the dune and about 10-20 cm from the open end of the box.

4. Turn on the hair dryer at the lowest speed, and direct the air toward the model sand dune for 1 minute.

5. Record the new location of the model dune.

6. Repeat steps 5 and 6 three times. After each trial, measure and record the location of the dune’s peak.

**Station #1 – DUNE MOVEMENT**

**Student Analysis and Conclusions**

1. How far did the dune move during each trial?

2. How far did the dune move overall?

3. How might the dune’s movement be affected if you were to turn the hair dryer to the highest speed?

**Station #2 – ACIDS REACT!**

***Materials****: 3 pcs of marble, 3 pcs of granite, HCl, Pipet, small dish*

***Procedures***:

1. Put on safety goggles
2. Place 3 pieces of marble into a small dish
3. Place 3 pieces of granite into another small dish
4. Get HCl from your teacher
5. Using a pipet add enough HCl to cover the samples in both dishes
6. Observe and record the effects of the HCl every 3 minutes.

**Station #2 – ACIDS REACT**

**Student Analysis and Conclusions**

Data Collection Table

|  |  |  |
| --- | --- | --- |
| **Rock** | **Time** | **Observation** |
| **Granite** | 3 min |  |
| 6 min |  |
| 9 min |  |
| **Marble** | 3 min |  |
| 6 min |  |
| 9 min |  |

1. What changes did you observe in each sample?

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2. Did a chemical change occur?

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3. Based on the observations, which sample is the most resistant to chemical weathering?

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**Station #3 – MAKING DESERT PAVEMENT**

***Materials****: Sand, clay, gravel, fan, safety goggle, dust masks*

***Procedures****:*

 1. Spread a mixture of clay, sand and gravel on the table.

 2. Place the fan at one end of the table.

 3. Put on Safety goggles and filter mask

 4. Aim the fan across the sediment on the table (facing the wall).

 5. Start the fan on its lowest setting.

 6. Let fan run for 1 minute.

 7. Record your observations.

 8. Turn the fan on to the medium setting. Run for 1 minute.

 9. Record your observations.

 10 Turn the fan on the highest setting. Run for 1 minute.

11. Record your observations.

**Station #3 – MAKING DESERT PAVEMENT**

**Student Analysis and Conclusions**

|  |  |  |
| --- | --- | --- |
| **Fan Setting** | **Time run** | **Observations** |
|  |  |  |
|  |  |  |
|  |  |  |

1. What is the relationship between the wind speed and the size of the sediment that is moved?

2. Does the remaining sediment fit the definition of desert pavement? (See page 69 of the Earth’s Changing Surface textbook)

**Station #4 – VOCABULARY, DO YOU KNOW IT?**

***Materials****: Vocabulary Flashcards*

***Procedures****:*

1. In pairs or in the group of three you will be taking turns quizzing each other on the vocabulary terms for this unit.

2. If you respond with the correct definition (the response does not have to be word for word as it is written on the card. If you are close count it.)

3. Correct response cards go in a pile for correct answers.

4. If your partner does not know the definition of a term, read it, put the card in a separate pile for incorrect answers and move on.

5. Record the number of correct and incorrect responses for all players in your group.

**Station #4 – VOCABULARY, DO YOU KNOW IT?**

**Student Analysis and Conclusions**

1. List the names of the student(s) that were quizzed. Put your name at the top of the list.

2. Record of scores.

|  |  |  |
| --- | --- | --- |
| **NAME** | **# CORRECT** | **# INCORRECT** |
| YOU |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

3. What do you think you can do to improve your vocabulary skills?

**Station #5 – A BUBBLY GOOD TIME**

***Materials****: Limestone, HCl, foil pan, safety goggles, droppers*

*Procedures:*

1. Put on your safety goggles
2. Put a piece of limestone into the foil tray

 3. Record your observations of the chalk.

 4. Get 10 mL of HCl from the teacher.

4. Using the dropper one drop at a time drop five drops of the HCl on the piece of chalk.

5. Record your observations

6. Repeat steps 4 and 5 five times.

**Station #5 – A BUBBLY GOOD TIME**

**Student Analysis and Conclusions**

Data Collection Table

|  |  |  |
| --- | --- | --- |
| **Trial** | **Total Number of Drops** | **Observations** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

1. Why do you think the reaction that took place occurred?

2. What would this demonstration best resemble in nature?

**Station #6 - GLACIERS**

***Materials****: Ice cube, modeling clay, sand, foil trays*

*Procedures:*

1. Take out one of the half sticks of clay. Push it together to make a box of clay.

2. Get an ice cube from the freezer.

3. Press the ice cube against the flat surface of the modeling clay. Move it back and forth 10 times.

4. Record your observations.

5. Put the clay in the center of the foil tray.

5. Using the scoop put a small scoop of sand onto the clay.

6. Place the ice cube on top of the sand and leave it for one minute.

7. Remove the ice cube and record your observations.

8. Put the ice cube back on the sand and clay. Rub the ice cube back and forth on the clay 10 times.

9. Remove the ice cube.

10. Wipe the sand off the clay.

11. Record your observations.

**Station #6 – GLACIERS**

**Student Analysis and Conclusions**

Data Collection Table

|  |  |
| --- | --- |
|  | **OBSERVATIONS** |
| Ice Cube on Clay |  |
| Ice cube, sand and clay |  |

1. What happened to the clay the first time you wiped the cube against it?

2. What happened to the ice cube after it sat on the on the sand?

3. What did the surface of the clay look like after you rubbed the cube against it the second time?

4. Does glacial erosion still occur today or is it just an ice age phenomena?

5. Can you give any examples of Glacier erosion?

**Station #7 – SHAKE, RATTLE AND ROLL**

***Materials:*** *15g Marble Chips; 15g halite chips; 15g granite chips; Sample container with lid; water; stopwatch; digital scale; magnifying glass*

***Procedures:***

1. Measure out approximately 15g of marble chips.
2. Record the mass of the chips in your data table.
3. Place the chips into the sample container
4. Add enough water to cover the chips
5. Record your observations
6. Put the lid on the container
7. Shake the container for 3 minutes
8. Record your observations
9. Pour off the water on the chips, dry the chips with paper towel.
10. Measure the mass of the chips
11. Record your data.
12. Using a magnifying glass observe the condition of the chips. Look closely at the edges and surface of the chips.
13. Record your observations
14. Put the chips back into the container.
15. Repeat steps 4-14 three more times for a total of 12 minutes of shaking.
16. Follow steps 1-15 for halite and granite chips (Do all three rock types at a time; otherwise you will NOT have time to finish).

**Station #7 – SHAKE, RATTLE AND ROLL**

**Student Analysis and Conclusions**

Data Collection Table

|  |  |  |  |
| --- | --- | --- | --- |
| **Rock** | **Time** | **Observations** | **Drawings** |
| **Granite** | 3 min |  |  |
| 6 min |  |  |
| 9 min |  |  |
| 12 min |  |  |
| **Halite** | 3 min |  |  |
| 6 min |  |  |
| 9 min |  |  |
| 12 min |  |  |
| **Marble** | 3 min |  |  |
| 6 min |  |  |
| 9 min |  |  |
| 12 min |  |  |