Glacier Simulation Activity

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Objectives:

- Determine the factors that affect the motion of glaciers, and calculate the speed of glacier movement.
- Discover what a glacier budget means for the growth and destruction of a glacier, and describe the features it leaves behind.

Background:

1. Describe the following terms (Use pages 363-365 in your textbook):

a. Glacier –

Continental Glaciers –

Valley Glaciers –

b. Moraines –

c. Eskers –

d. Drumlins –

e. Kettle lakes –

2. Understanding glacier formation, what is the relationship between the following:
   a. Temperature and glacier size

   b. Snowfall amount and glacier size.

Explain what causes a glacier to grow or recede?

Procedure:

1. Open https://phet.colorado.edu/sims/cheerpj/glaciers/latest/glaciers.html?simulation=glaciers/
2. * Turn off the snowfall effect. Play with simulation for 5 minutes. Grab the bear and change viewpoints, try to make the glacier grow/shrink. If the glacier disappears hit the "**Reset All**" button.

4. Equilibrium line: This line indicates the boundary where the freezing meets the melting of the glacier. Change some factors and describe what happens to the equilibrium line and what happens to the glacier.

   - When you set the temperature and snowfall; and hit the STEADY STATE button, what happens to the glacier?

Predictions and Observations: Make a prediction to answer the question. Play with the simulator to mimic the situation and answer the question.

1. If the average annual snowfall increases (m/yr), what will happen to the glacier?

2. If the temperature changed, describe the two things that could change in the glacier.

3. If the temperature is decreased and the snowfall is increased,
   a. Will the equilibrium line move up the mountain or down the mountain? Explain.

   b. What will this do to the glacier? (advance or retreat) Explain.

   c. What will happen to the glaciers thickness and length if the climate change as #3 describes?

4. Use the textbook (pg. 364-365). Look at the picture below and identify at least 5 depositional features on the glacier in Alaska. Draw the image on page 364-365 in your notebook.