Name _____ Date _____

Insolation and Ecosystems

Background- This activity is designed to pull together your knowledge of Earth Science and Living Environment. Earth systems are all interconnected in ways you might not even realize, this activity will help you connect information learned in 2 different science classes. Making connections is a skill you will use throughout your life.

What is insolation? _____

What is the angle of insolation? _____

What is an ecosystem? _____

What factors impact the sustainability of an ecosystem? _____

_____

_____

Model Directions

1. Open the model in NetLogo named Insolation and Ecosystems.
2. Take a couple minutes to familiarize yourself with the model; play with the buttons, see how things work. FYI: The precipitation scale is based on average (50) precipitation, too much (100) precipitation and not enough (0) precipitation.
3. Read through the questions below.
4. Use the model to answer the questions
5. Write your conclusion (Remember: include what you learned and any questions you might have about the activity. Do Not include how you felt about the activity!)

Using the Model

	Palms			Pines			Deciduous Trees			Ants			Cows			Squirrels		
Precipitation	50	0	100	50	0	100	50	0	100	50	0	100	50	0	100	50	0	100
90°																		
60°																		
30°																		
0°																		

1. Set your **angle of insolation to 90** and your **precipitation to 50.** Push the set-up button. Record the number of each plant and animal listed in the in the chart above. (If there are none, put a 0).
2. Push the go button, run the model for about 200 ticks, push go to stop the model. What happened to the plants and animals?

    _____

    _____

3. Change the precipitation to 0, run the model about 200 ticks and record the numbers in the chart above.

4. Change the precipitation to 100, run the model for about 200 ticks and record the numbers in the chart above.
5. Now repeat steps 1-4 with the remaining 3 three angles of insolation.
6. What happened in the ecosystem at 0° angle of insolation for each trial? Why aren't there plants in this ecosystem?

_____
_____

7. How does angle of insolation affect an ecosystem?

_____
_____

8. How did changing the precipitation impact the plants and animals in your ecosystems?

_____
_____

9. What would we call a period of time with below average rainfall in a region? _____

_____

10. What might happen during a time of excessive precipitation in a region? How will this impact the ecosystem? _____

_____

11. Calculate the latitude of each ecosystem using the angle of insolation and the rule for complimentary angles. Use a map to find some locations located at each latitude (can be states or countries). Use your text book to list the different types of climate zones that can be found at these latitudes.

Angle of Insolation	Latitude	Locations	Climate Zones

12. Why does the angle of insolation vary based on latitude?

_____
_____

13. What other factors (besides latitude and precipitation) may play a part in creating different climate zones and ecosystems?

_____
_____

Conclusion

_____
_____
_____

_____
_____