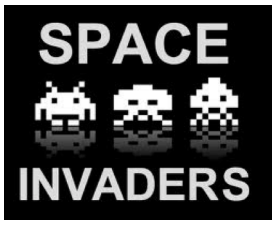

AP Biology Name:

Space Invaders – Observation/Inference & Making Claims with Evidence

(adapted from many sources)

"Invaders" have infiltrated our room!!! They have never been encountered or seen before so we know very little about them (nothing about their anatomy or physiology, nothing about their behavior, sociology or culture). As the first scientists to have encountered them it is up to you to begin to characterize them. You and your group will be assigned to observe one color of invader BUT you will also need to make observations of the entire invasion as a whole. You goal is to understand and describe any trends/patterns there are in the way the invaders are distributed. In doing this, you will need to make "claims" about the invaders distribution but you will need to be able to give evidence to support your claim. As you move around the room, use the table below to record/collect your observations (evidence). Then use your evidence to make a claim and then link your claim to the evidence in an explanation. Keep an open mind and be careful not to make things up or over state them – be objective!

RULE: You may NOT TOUCH or TAUNT the invaders.

Group Member Names: **Space Invader Color:_____**

Question	
What patterns of invasion are seen in this population of space invaders?	
Evidence (qualitative observations, data transformations – mean, median, rate, descriptive statistic, graph description, etc...)	**Science Idea, Concept, or Principle** (identify the ideas/concepts/principle(s) that are associated with the evidence)
Claim (the claim should answer the question – what trend/pattern/sequence/cause-effect does the evidence appear to show is happening?)	
Explanation (Justify your claim by stating HOW your data is related to your claim and how the science idea/concept strengthen the argument. In other words...link your claim to the evidence and the science concepts. Make sure that your explanation is both sufficient (incorporates ALL relevant evidence; if you ignore evidence state WHY) and appropriate (that the evidence is actually related to experiment/claim)	

Class Discussion – Now that you have had some time to talk to each other and you have made your claim. Talk to the other group(s) that also had the same colored space invader. Compare your evidence, your claim and your explanation.

1. What observations did other groups make that you did not?

2. How did these observations affect your claim? Did you change your claim? Why or why not?

3. "Rules Of Invasion" – Let's compile the "science" for each of the colors (not just your own this time)

Space Invader Color: Red	
Claim (Rule of Invasion)	Explanation with Evidence:
Space Invader Color: Yellow	
Claim (Rule of Invasion)	Explanation with Evidence:
Space Invader Color: Blue	
Claim (Rule of Invasion)	Explanation with Evidence:
Space Invader Color: While	
Claim (Rule of Invasion)	Explanation with Evidence:
Space Invader Color: Orange	
Claim (Rule of Invasion)	Explanation with Evidence:
Space Invader Color: Green	
Claim (Rule of Invasion)	Explanation with Evidence:

4. Go to: Dictionary.com and define the terms "observation" and "inference". How are they different? When you were investigating the space invaders, when did you engage in observation and when did you engage in inference?

5. Describe any way that you can think of that might allow you to test your claim? Is there anyway to do this?

6. Reflect on the "actions" you and your partners took and on the "strategies" you used in this activity. What were the strongest actions/strategies you used? Why were they strong? What were the weakest actions/strategies you used? Why were they weak?

7. If you were to do a similar task tomorrow, what would you do differently in order to make more informed decisions about what you were studying?

8. Describe how this experience related to EACH of the following statements
    A. Students engage in scientific questioning to extend thinking or guide investigations.
    B. Students plan and implement data collection strategies appropriate to a particular scientific question.
    C. Students analyze data to identify patterns.