

## Chapter 6, Lesson 11 Activity Sheet Answers

1. The feature that keeps an instant heat pack from getting warm before you want it to is that there is something you need to do to activate it. You either take a pouch out of a wrapper and expose it to air, or bend a little metal disc, or break open a pouch of water to let chemicals mix and dissolve.
  
2. The criteria for a temporary portable reptile egg incubator are:
  - Small and light-weight
  - Uses small amounts of chemicals
  - Gets to the right temperature and stays there long enough
  - Can help support and protect the egg
  
3. The constraints for a temporary portable reptile egg incubator are:
  - The chemicals might not produce the right temperature
  - Might need a large amount of chemicals to make it work (too expensive and wasteful)
  - The temperature might not stay in the right range long enough
  
4. According to the Reptile Egg Identification chart the eggs are:
  - a. Snake eggs
  - b. They are the right length and have an oblong shape. They were also found on the surface of the ground.
  - c. The eggs should be kept at 28 - 32 C°.

<b>How much does the temperature increase?</b>		
	<b>¼ tsp. calcium chloride</b>	<b>½ tsp. calcium chloride</b>
<b>Initial temperature</b> Just water	22 °C	22 °C
<b>Final temperature</b> Water plus calcium chloride	32 °C	42 °C
<b>Change in temperature</b> Final temperature – Initial temperature	10 °C	20 °C

How does baking soda affect the temperature of the calcium chloride solution?	
Temperature of the calcium chloride solution from Step 4	40 °C
Calcium chloride solution plus 1/8 teaspoon baking soda	32 °C
Change in temperature	8 °C

Should we use baking soda in the design of a portable reptile egg incubator?	
Disadvantages	Advantages
It might produce too much gas and pop the bag.	Yes, it can be used to adjust the temperature and to produce a gas which can cushion the egg.

About how much calcium chloride, baking soda, and water should be mixed to reach the right temperature range to incubate snake eggs?			
Calcium chloride	½ tsp.	Temperatures will vary due to the amounts students choose.	
Baking soda	⅛ tsp.		
Water	15 mL	15 mL	15 mL
Initial temperature Just water	40 °C	? °C	? °C
Final temperature Highest temperature reached	32 °C	? °C	? °C

What temperature does the thermometer reach when it is placed beneath the solution where the chemical reaction is taking place?	
Final temperature Highest temperature reached	The temperature will vary but should be between 28 and 32 degrees Celsius.

5. Yes. Enough heat transfers through the bag.
6. The gas sealed in the bag could be a little cushion to support the egg in the right position and to protect it from impacts.
7. Drawing: The device should be some kind of cup with the heat pack students designed inside. The cup could have layers of paper, bubble wrap, or other insulating material on the outside. It might also have some insulating material on the inside.

Captions:

- *Keep the egg at the ideal temperature for as long as possible*  
The heat pack and insulating materials work together to keep the egg at the ideal temperature.
- *Hold the egg in the proper orientation*  
The bag and insulating material inside the cup holds the egg in the proper position.
- *Protect the egg from impact*  
The bag is inflated a bit to providing cushioning to protect the egg.