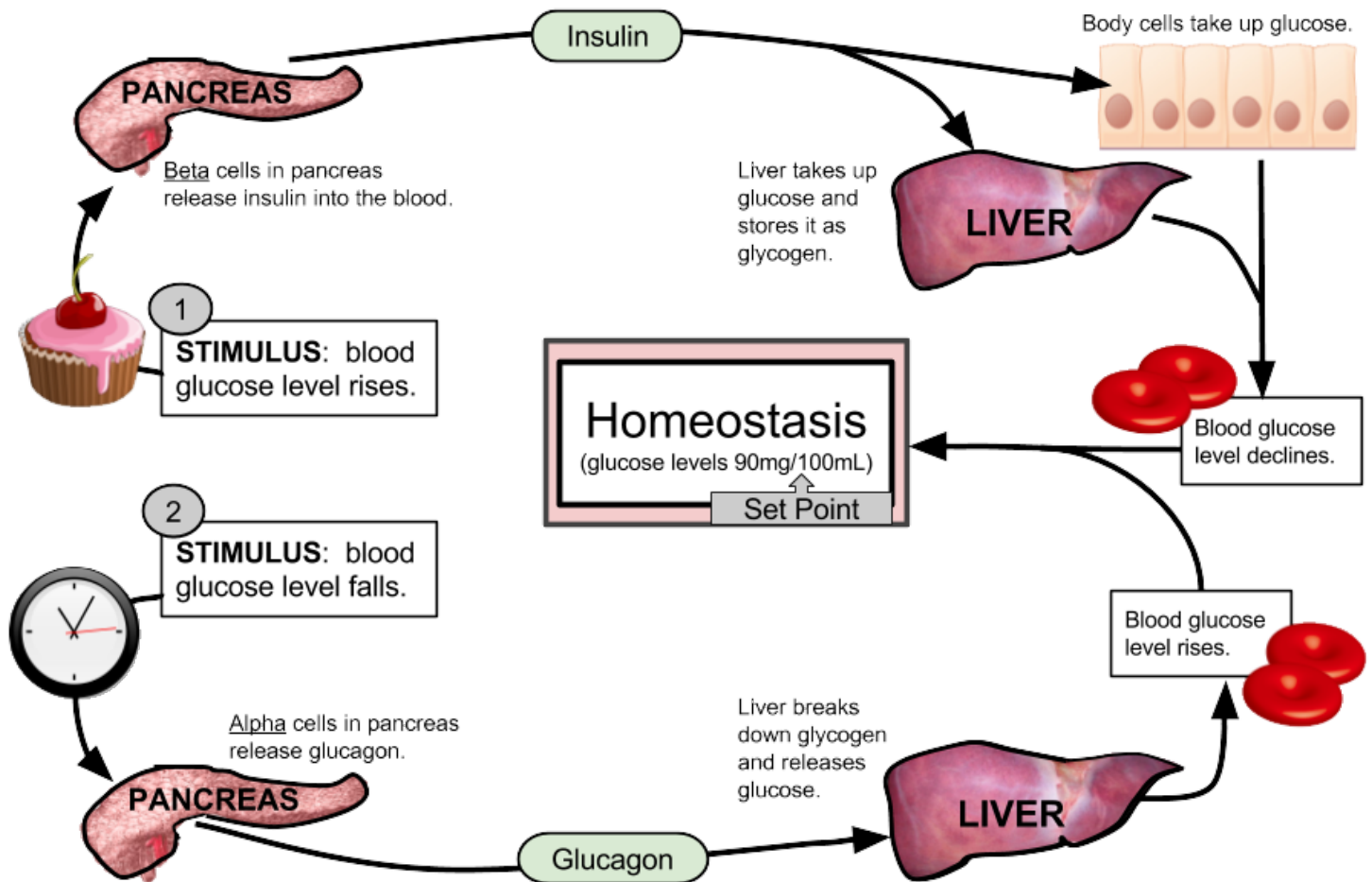


Name: _____

Feedback Loops: Glucose and Glucagon

The control of blood sugar (glucose) by insulin is a good example of a negative feedback mechanism. When blood sugar rises, receptors in the body sense a change. In turn, the control center (pancreas) secretes insulin into the blood effectively lowering blood sugar levels. Once blood sugar levels reach homeostasis, the pancreas stops releasing insulin. Examine the graphic below to understand how this feedback loop works.



1. The image shows two different types of stimuli (1 and 2), but doesn't explain what the stimuli is that causes blood sugar to raise or lower. Based on clues in the graphic, what are the two stimuli?

2. What happens when your blood sugar rises?



3. What is the effect of glucagon? What cells release glucagon?

4. What is the effect of insulin? What cells release insulin?

5. What is the normal level of glucose in the blood? Why is this called a "set point."

6. What would you expect to happen if your blood sugar was 120 mg / 100 mL ? Be specific.

7. A person with diabetes cannot regulate their blood sugar, mainly because the pancreas does not release enough insulin. To treat the disease, a person must monitor their blood sugar, if their blood sugar is high, they must take an injection of insulin. How do you think they would need to treat low blood sugar?

8. In a single sentence, explain the relationship between the pancreas and homeostasis.

9. Where does the glucose that is released into the blood ultimately end up (2 places)?

10. Explain how the thermostat in your house uses a negative feedback system to maintain your home's temperature.