

# Endocrine System Extension

Insulin is a protein hormone that is secreted into the blood by the pancreas. Clinicians rarely measure insulin levels, but the procedure is regularly done in research labs studying diabetes.

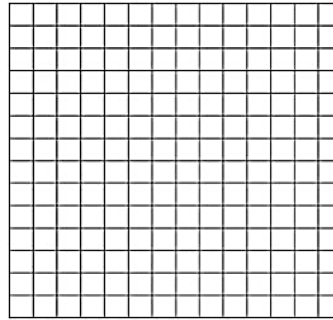
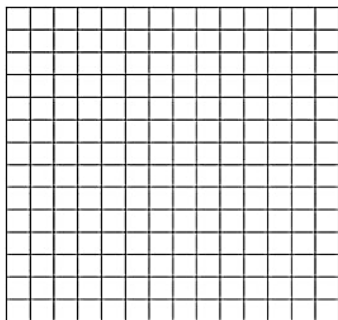
The following data show blood insulin levels that correspond to the blood glucose levels in the OGTT used in Model 1.

## Measurements recorded during OGTT

Time (minutes)	0	30	60	90	120
<u>Maria:</u> Blood Glucose (mg/dL)	90	140	150	135	110
<u>Maria:</u> Blood Insulin (pmol / L)	45	140	200	220	150
<u>Laura:</u> Blood Glucose (mg/dL)	110	170	220	270	300
<u>Laura:</u> Blood Insulin (pmol / L)	25	60	80	85	90

What units are used to measure blood glucose? What units are used to measure blood insulin?

On your own, draw two graphs-- one showing Maria's glucose and insulin levels vs. time, and the second showing Laura's glucose and insulin levels vs. time.



## Glue Endocrine System Extension Tab Here

Which individual above (Maria or Laura) had the greater pancreatic response to the OGTT? How do you know?

On your own, write a grammatically correct sentence describing the relationship between blood glucose and blood insulin levels.

Diabetics are often required to monitor their blood glucose levels to determine if/when they require a shot of insulin. Under what conditions should diabetic individuals give themselves a shot of insulin?

Three college students (Carter, Linden, and Miriam) have their blood glucose levels measured for six hours. All three recorded what they ate for breakfast at 7:30 am, but did not record any other intake of food.

Carter's Breakfast: Orange juice, high fiber regular oatmeal, and a banana.

Linden's breakfast: Sugar soda pop, Chocolate Frosted Sugar bombs, and two cups of coffee (with sugar).

Miriam's breakfast: Bacon, eggs, and two cups of black coffee.

### Student Blood Glucose Levels

Time (minutes)	7am	8am	9am	10am	11am	Noon	1pm
<b>Carter:</b> Blood Glucose (mg/dL)	70	140	140	80	80	80	115
<b>Linden:</b> Blood Glucose (mg/dL)	70	170	55	170	55	160	55
<b>Miriam:</b> Blood Glucose (mg/dL)	70	80	80	80	70	70	90

Construct one graph that documents how each student's blood glucose levels changed over the time period shown.

