PROJECT GUTS
Growing Up Thinking Scientifically

C O D E

Model Observation Form

Name(s): _____Date: _____

Model name: _____

Abstractions
Who are the <u>Agents</u>? What is the <u>Environment</u>? What are the <u>Interactions</u>?   *How much time does the main forever loop represent? (minutes? days? months? years?)*   *What are the variables of interest?*
Automation
What happens each time through the forever (or main) loop?
Assumption(s)
What real life elements or behaviors were left out of this model?
Analysis
What patterns did you observe? Do these patterns occur in real-life?

Model Design Form

Name(s): _____ Date: _____

Model name: _____

MODEL DESCRIPTION
What will be modeled?
What abstractions are used?
What do the agents represent?
What does the space or environment represent?
What are the Interactions?
How much time does the main forever loop represent? (minutes? days? months? years?)
What are the assumptions made? What real life elements or behaviors were left out of this model?
How will it be modeled?
What happens when simulated time advances?

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Scientific Practices with Computer Modeling & Simulation

Name: _____ Date: _____

The table below lists scientific practices.   Please provide an example of what you did that matches the practice.

Practices:	
Asking questions and defining problems	
Develop and use a model	
Plan and carry out an investigation	
Analyze and interpret data	
Use mathematics and computational thinking	
Construct explanations and design solutions	
Engage in argument from evidence	
Obtain, evaluate, and communicate information	

Experimental Design Form

Name(s): _____ Date: _____

Model name: _____

Question
What is your question?

Variables
What are the dependent and independent variables in your experiment?

Range
What is the range of values you will use for each variable?

Trials
How many trials will you run at each setting? Why?

Prediction
What effect do you think the changes you make will have on the model?

Data Collection
What data will you collect?

Data Analysis
How will you analyze your data? (i.e. look for patterns, compare final values, look at the graph)

Interpretation
What is the answer to your question? How does the analysis of your data help you answer your question?

Project Design Form

Name(s): _____ Date: _____

Model name: _____

As you create a computer model of a scientific phenomenon, use this form to help you organize your thoughts and develop the model from start to finish.

PROJECT DESCRIPTION
What question do you seek to answer?
What observation of phenomenon, model, or unexpected result led you to this question?

MODEL DESCRIPTION
What will be modeled?
What question do you seek to answer?
How will it be modeled? What abstractions are used?
Who are the <u>Agents</u>? What is the <u>Environment</u>? What are the <u>Interactions</u>? *How much time will the main forever loop represent? (minutes? days? months? years?)* *What are the parameters of interest?*

EXPERIMENTAL DESIGN

Variables

What are the dependent and independent variables in your experiment?

Range

What is the range of values you will use for each variable?

Trials

How many trials will you run at each setting? Why?

Data Collection

What data will you collect?

Prediction

What effect do you think your variables will have on the model?

Data Analysis

How will you analyze your data?

Interpretation

How does the analysis of your data help you answer your question?

Going further

If you had more time, what further changes would you make to your model?