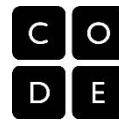# Computer Science in Science

Common Forms

Note to the teacher: Print four of each of the student activity forms in this document. Students will need one in each of the four *CS in Science* modules.

- Model Observation Form
- Model Design Form
- Scientific Practices with Computer Modeling & Simulation
- Experimental Design Form
- Project Design Form

Model Observation Form

Name(s): _____Date: _____

Model name: _____

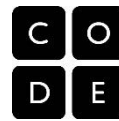| Abstractions |
| --- |
| *Who are the <u>Agents</u>?   What is the <u>Environment</u>?   What are the <u>Interactions</u>?*
What do ticks represent?

What are the variables of interest?

 |
| **Automation** |
| *What happens each time through the forever (or main) loop?*

 |
| **Assumption(s)** |
| *What are the assumptions made in 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?* |
| *What do ticks represent?* |
| *What are the assumptions made?* |
| **How will it be modeled?** |
| *What happens when simulated time advances?* |
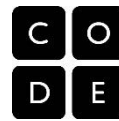
Scientific Practices with Computer Modeling & Simulation

Name(s): _____Date: _____

The table below lists scientific practices.   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	
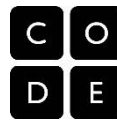
Experimental Design Form

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?

Data Collection
What data will you collect?

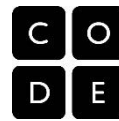| **Data Analysis** |
|---|
| *How will you analyze your data?* |
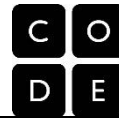
Interpretation

What is the answer to your question?

Interpretation

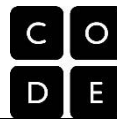*How does the analysis of your data help you answer your question?*

Project Design Form

Name(s): _____Date: _____

Model name: _____

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>? What do ticks represent?   *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?

Data Analysis

How will you analyze your data?

Interpretation

What question do you seek to answer?

Interpretation

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