Activity sheet

Rubric: Modelling a feedback system

Name:

Class:

Criterion	Well above the standard (4)	Above the standard (3)	At the standard (2)	Working towards the standard (1)	Not shown (0)
Science Inquiry Skills *Questioning and predicting* Formulate questions or hypotheses that can be investigated scientifically.	States the feedback system being designed, and hypothesises how the model demonstrates homeostasis, through its feedback mechanism.	States the feedback system being designed, and explains how features provide feedback.	States the feedback system being designed, and names the features providing feedback.	States the feedback system being designed.	Not shown.
Science Inquiry Skills *Planning and conducting* Plan, select and use appropriate investigation methods, including laboratory experimentation to collect reliable data; assess risk and address ethical issues associated with these methods.	The design methodology is complete. The manipulation of variables is described, including how these will contribute to data collection. Risks are analysed. An explanation of whether or how they were minimised has been included.	The design methodology is complete. The manipulation of variables is described. Risks have been considered in the design, including attempts to minimise them.	The design methodology is complete. Variables are not named. Risks are considered in the design.	The design methodology is incomplete Risks are not considered in the design.	Not shown.
Planning and conducting Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data.	The equipment is complete. The model works accurately and systemically.	The equipment is complete. The model works with continual manipulation.	The equipment is complete. The model gives an impression of how it may work.	The equipment is incomplete.	

Criterion	Well above the standard (4)	Above the standard (3)	At the standard (2)	Working towards the standard (1)	Not shown (0)
Science Inquiry Skills *Processing and analysing data and information (the model as a homeostatic system)* Use knowledge of scientific concepts to draw conclusions that are consistent with evidence.	Data from the model is analysed as a flow diagram, and is fully compared to components in a homeostatic system (set points, sensors, control mechanisms and effectors), e.g. in a table.	Data from the model is described, and analogies to homeostatic systems are identified in a numerical or visual interpretation.	Feedback is described in the model. There is an attempt to interpret this numerically or visually.	Intended feedback is identified in the incomplete model. There is no attempt to show this numerically or visually.	Not shown.
Science Inquiry Skills *Evaluating* Evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data.	Limitations of the feedback model are critiqued and an explanation of how it might be improved included.	An explanation of how the feedback model might be improved included.	Improvements to the feedback model are identified.	Improvements to the method are suggested.	Not shown.
Evaluating Critically analyse the validity of information in secondary sources and evaluate the approaches to solve problems.	Relates the model to a real homeostatic system and evaluates the effectiveness (validity) of the models generally as an approach to understanding physiology.	Relates the model to a real homeostatic system and evaluates the effectiveness (validity) of the model for this.	Relates the model to a real homeostatic system.	Attempts to relate the model to a real homeostatic system.	

Criterion	Well above the standard (4)	Above the standard (3)	At the standard (2)	Working towards the standard (1)	Not shown (0)
Science Inquiry Skills *Communicating* Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments.	The working model is demonstrated. Oral communication of scientific ideas is planned and projected, and the audience engages with the science	The model is demonstrated. Oral communication of scientific ideas is audible, and the audience is engaged.	The model is presented. Oral communication of scientific ideas is audible.	The model is presented. Oral communication of scientific ideas is ineffective.	Not shown.
Communicating Use appropriate scientific language, conventions and representations.	Scientific language consistently used appropriately. Sources are documented correctly.	Scientific language usually used appropriately. Sources are documented correctly.	Scientific language used, but often inappropriately. There is an attempt to document sources correctly.	Attempts to apply scientific language, with limited effectiveness. There is no attempt to document sources.	

Grade:	A+	20	A	17–19	B	14–16	C	11–13	D	8–10	E	5–7	UG	<5

Comments: