



Developing Science and Engineering Practices with WeDo 2.0

WeDo 2.0 projects will develop science practices. They provide opportunities for students to work with and develop ideas and knowledge as well as an understanding of the world around them.

The progression and difficulty level in the projects allow students to develop competency while exploring and learning about key science topics. The projects have been carefully chosen to cover a wide variety of topics and issues.

WeDo 2.0 projects develop eight science and engineering practices:

1. Ask questions and solve problems
2. Use models
3. Design prototypes
4. Investigate
5. Analyze and interpret data
6. Use computational thinking
7. Engage in argument from evidence
8. Obtain, evaluate, and communicate information

The guiding principle is that every student should engage in all of these practices across the projects in each grade.



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The science and engineering practices serve as the common thread throughout the curriculum, and all standards should, in essence, be taught through them.

While the academic definition of each process is important, it is probably a good habit to verbalize the practices in a way that is understandable to students at that level.

The following identifies the basic principles of these practices and gives examples on how they are used in WeDo 2.0 projects.

1. Ask questions and define problems

This practice focuses on simplistic problems and questions based upon observational skills.

2. Develop and use models

This practice focuses upon students' prior experiences and the use of concrete events in modeling solutions to problems. It also includes improving models and new ideas about a real-world problem and solution.

3. Plan and carry out investigations

This practice is about how students engage in an investigation process to formulate probable solution ideas and to test these ideas.

4. Analyze and interpret data

The focus of this practice is to learn ways to gather information from experiences, document discoveries, and share ideas from the learning process.



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5. Use mathematics and computational thinking

The purpose of this practice is to realize the role of numbers in data-gathering processes. Students read and gather data about investigations, make charts, and draw diagrams resulting from the numerical data. They add simple data sets to come up with conclusions. They understand or create simple algorithms.

6. Construct explanations and design solutions

This practice is about ways they might go about constructing an explanation or designing a solution for a problem.

7. Engage in argument from evidence

Constructively share ideas based upon evidence that it is an important feature of science and engineering. This practice is about how students begin to share their ideas and demonstrate evidence to others in a group.

8. Obtain, evaluate, and communicate information

Teaching children what real scientists do is key to this practice. The way in which they set up and complete investigations to gather information, how they evaluate their findings, and how they document are all important elements. It is important that teachers explore a plethora of ways to have students gather, record, evaluate, and communicate their findings. Ideas include digital presentations, portfolios, drawings, discussion, video, and interactive notebooks.



Developing Computational Thinking Practices with WeDo 2.0

Computational thinking refers to a set of skills that are used in various fields and situations, and in our daily lives. These skills are not only associated with the field of computer science field and they're not intended to make people think like computers. The skills associated with computational thinking can help us to solve problems.

WeDo 2.0 develops students' computational thinking skills in the following ways:

Decomposition

Students will learn how to break down a problem into smaller parts in order to ease the process of finding a solution.

Generalization (Pattern Recognition)

Students will practice recognizing the parts of a task that are known or have been seen somewhere else.

Algorithmic Thinking

Students will define a sequence of steps for solving a problem. Creating and ordering these steps in a computing context often refers to the idea of coding or programming.

Evaluating

Students will evaluate whether or not their prototype works in the way they intended. If not, they will identify what needs to be improved.

Abstraction

Students will explain their solution with a sufficient level of detail, while omitting the unimportant details.

Computational thinking

Ways we solve problems

