

Pequea Valley School District
STEM

Unit 1: Digital Literacy

Course: STEM 1

Grade: 1

Planning the Focus Based on the Desired Result
What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s)

1. How do I use technology to effectively communicate, create, think critically, and collaborate with others?
2. How do I use computer coding to accomplish tasks and solve problems?

Keystone Eligible Content/PA Core Standard

Standard - **15.1.2.B**- Ask and answer questions about right and wrong (ethics) in the classroom.

Standard - **15.3.2.N**- Identify positive work habits in the classroom.

Standard - **15.4.2.B**- Demonstrate responsible use of technology and equipment.

Standard - **15.4.2.G**- With help and support, select and use various software/applications for an intended purpose.

Standard - **CC.1.4.1.A**- Write informative/ explanatory texts to examine a topic and convey ideas and information.

Pacing: Approximate number of class sessions per unit

- 7

Tier 3 Vocabulary (Content specific vocabulary)

app, share, import, export, backup, stylus, algorithm, loop, troubleshoot, code, create, communicate, collaborate.

Know - What do students need to **know** in order to be able to do and understand? *List concepts, such as facts, formulas, key vocabulary and knowledge “nuggets”.*

Applications and the 4 C’s

1. Notability - opening an application
2. Notability- writing using a finger and/or stylus and color options
3. Notability- typing text
4. Notability- taking a picture
5. PicCollage- using the software to import pictures into a project
6. PicCollage- Adding online pictures
7. PicCollage- Adding text to a project.

Coding

1. An algorithm is a list of step-by-step directions that a computer follows to complete a task.
2. Create an algorithm for a sprite to follow in the app, “the Foos”
3. Loops are lines of code that repeat over and over again.
4. To troubleshoot means to look for errors in code that keep our sprite from completing the task.

Understand - What do students need to **understand**? What is the **big idea**? *List broad concepts or “big ideas” in a statement of enduring understanding.*

Digital Literacy-

1. Understand that Notability is used to gather information or create simple written ideas about a topic.
2. PicCollage is a tool used to communicate using visuals and text.
3. Technology can be used to communicate our ideas to ourselves, others, and the world, in the way we understand it.

Coding:

1. Coding is giving a computer directions to follow in order to solve a problem.
2. When problems arise in an algorithm, we can solve them through Troubleshooting.

Learning Outcome - What do students need to be able to **accomplish** by the unit’s end? *List skills and competencies.*

Digital Literacy and the 4’C’s

1. Students will be able to:
 - a. use Notability in the classroom to respond to literature and content taught in the classroom that requires audio, text, or picture recording of information.
 - b. Use PicCollage to create a picture collage using pictures, text, and other media that communicates a message

Coding:

1. Students will be able to:
 - a. Create an algorithm to accomplish a task that requires up to 4 blocks of code.
 - b. Identify an algorithm that accomplishes a task in multiple choice with up to 4 actions or blocks of code.
 - c. Put an algorithm in order from first to last in a simple, real life situation.
 - d. Identify an looped algorithm from a set of answer choices that accomplishes a task.

Assessments:

1. Respect to Self, Others, and World project
2. The Foos mini assessment T.O.D.- Assessed at the end of each skill.

Software/Resources:

1. ipad’s - 1 per student
2. Notability App
3. PicCollage App

4. Safari App

5. the Foos App

Pequea Valley School District
STEM

Unit 2: Lego Engineering

Course: STEM 1

Grade: 1st grade

Planning the Focus Based on the Desired Result

What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s)

How do engineers design and develop solutions to problems in the real world?

Keystone Eligible Content/PA Core Standard

- **CC.2.4.K.A.1-** Describe and compare attributes of length, area, weight, and capacity of everyday objects.
- **CC.2.2.2.A.1-** Represent and solve problems involving addition and subtraction within 100
- **CC.2.4.1.A.1** Order lengths and measure them both indirectly and by repeating length units.
- **CC.2.4.1.A.4-** Represent and interpret data using tables/charts
- **3.1.1.A1:** Categorize living and nonliving things by external characteristics.
- **3.1.1.A2:** Investigate the dependence of living things on the sun's energy, water, food/nutrients, air, living space, and shelter.
- **3.2.1.B1:** Demonstrate various types of motion. Observe and describe how pushes and pulls change the motion of objects.

Pacing: Approximate number of class sessions per unit -

- 16 x 2 (students will go through a 2 year rotation of concepts- year 1 on Living things, year two on biomechanics and physical forces of motion)
Math concepts will be integrated based on building data needs assessments.

Tier 3 Vocabulary (Content specific vocabulary)

estimate, measure, half, inch, length, width, bones, joints, muscle, health, feature, zookeeper, happy, environment, temperature, shelter, diet, mass, weight, compare, equal, balanced.

Know - What do students need to **know** in order to be able to do and understand? *List concepts, such as facts, formulas, key vocabulary and knowledge "nuggets".*

Year 1

- How does my body create motion
- bar graphs
- recording data in a data table
- scientific method
- criteria

- variables

Year 2

- types of animal kingdoms
- living/nonliving
- using a balance
- comparing weights
- Coding an algorithm

Understand - What do students need to **understand**? What is the **big idea**? *List broad concepts or “big ideas” in a statement of enduring understanding.*

Year 1- Soccer

- In order for our bodies to move, we use muscles connected to joints that move our bones.
- Scientists make and record observations in charts and graphs.
- Scientists and engineers make changes to investigations in order to record observations and evaluate designs to meet desired criteria.

Year 2- Wild animals

- Living things need a proper diet, water, and shelter for survival
- Life cycle of living things is similar across organisms- birth, growth to maturity, reproduction, death.
- Different objects can be compared using scientific tools to make measurements

Both- Computers follow algorithms to complete tasks.

Learning Outcome - What do students need to be able to **accomplish** by the unit’s end? *List skills and competencies.*

Year 1- Play Soccer

- Students will be able to:
 - Describe how a body moves using the terms muscle and bones
 - Describe ways that you can record information you observe
 - Identify a variable in an experiment.

Year 2- Wild animals

- Students will be able to:
 - Describe the needs of animals.
 - Use a balance.

Assessments:

Year 1. -Play Soccer

- PicCollage on how bodies create motion
- Graph of tally chart

Year 2- Wild Animals

- program- alligator fact display
- balance sheet assessment

Software/Resources:

Note- This UAG covers a two year rotation. Year 1 is the soccer fan unit. Year 2 is the wild animals unit.

**Pequea Valley School District
STEM Department**

Unit 3: Weather and Windmill Design

Course: STEM 1

Grade: 1

Planning the Focus Based on the Desired Result

What do you want all students to know, understand and do by the end of the unit?

Unit Essential Question(s)

How do we use observations of nature to create solutions to problems?

Keystone Eligible Content/PA Core Standard

- **CC.2.4.2.A.4** - Represent and interpret data using line plots, picture graphs, and bar graphs.
- **3.2.1.B1**- Demonstrate various types of motion. Observe and describe how pushes and pulls change the motion of objects.
- **3.4.3.C1**- Recognizing **design** is a creative process and everyone can design solutions to problems.
- **3.4.4.C1**- Understand that there is no perfect **design**.
- **3.4.4.C2**- Describe the **engineering design process**: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item. Communicate the solution with others. Present the results

Pacing: Approximate number of class sessions per unit

- 14 weeks

Tier 3 Vocabulary (Content specific vocabulary)

- Ask
- Imagine
- Plan
- Create
- Improve
- Anemometer
- evaporate
- condensation
- precipitation
- engineering

Know - What do students need to **know** in order to be able to do and understand? *List concepts, such as facts, formulas, key vocabulary and knowledge “nuggets”.*

- test and evaluate products
- explain how to use various weather tools
- identify the water cycle steps

Understand - What do students need to **understand**? What is the **big idea**? *List broad concepts or “big ideas” in a statement of enduring understanding.*

- How do the steps of the water cycle work to replenish the earth’s supply of water.
- Use the engineering process to create a tool that satisfies a problem.

Learning Outcome - What do students need to be able to **accomplish** by the unit’s end? *List skills and competencies.*

- Describe the water cycle of a water droplet.
- Describe how the engineering process is used to design and make things better.

Assessments:

- Design a windmill and justify the materials used.
- PicCollage- Water cycle

Software/Resources:

Tools:

Anemometers (6 per building)

see supply list from [EiE kit \(Catching the Wind: Designing Windmills\)](#)