Title of Project:
How Does a Seed to Grow into a Plant?

Subject(s):
Science

Grade Level(s):
1

Abstract:
The engaged learning project will be to investigate and identify the basic needs of a plant and Students will demonstrate their findings of their experiments by making a clay animation video demonstrating the growth process when different variables are in place. The project will include a visit from a local gardening expert (perhaps from Cooperative Extension Service or local gardening club) to explain the actual process of planting a seed and the elements needed for it to grow and flourish. Donations of seeds, potting soil and containers will be sought (from my Mom’s local home & garden center) and students will plant seeds and change the variables in the amounts of water, air, and sunlight over a period of five-eight days and record their findings daily on a chart. Prior to this project’s beginning, their teacher will provide instruction on how a plant grows from a seed so students will have adequate prior knowledge on which to build further. The students will then transfer this knowledge into a series of frames using clay of different colors to form the different growth processes. Their informational “story” will be planned in a storyboard by the students of what each frame should depict and a “script” to go along with each frame, told in first person by the plant. The document camera will be used to capture images sequentially as the process changes. Students will be responsible for recording their voices over the appropriate frames to explain their findings for setting the appropriate time lapse for each frame to achieve the best presentation results. They will include the consequences of the lack of proper nutrients, sunshine, etc. for plants, too. Students will be assessed for content mastery by teacher based on finished product. These videos will be shown on the Whitlow Morning Howl news show, which airs daily through closed-circuit television throughout the school during the weekly segment, the “Science Spotlight of the Week”.

Learner Description/Context:
Learners are first graders at Whitlow Elementary School in Forsyth County, Georgia. Students are from various cultural and socio-economic backgrounds. Each activity will be completed by students with help from myself (the media specialist) and/or the instructional technologist and their teacher. Experts who will also assist in the project will be either an agent from the Cooperative Extensive Service or the Forsyth County Master Gardeners’ Club (or both).

The setting of the project will be the science lab at our school which will be booked ahead of schedule during the class’ science block for the days/time needed for the growing experiment. The “claymation” videos will be planned and produced either in the classroom or the media center. Recording onto frames will be done in a quieter area (perhaps the morning news room or the conference room) inside the media center.

Students will be actively and skillfully conceptualize how plants grow from seeds as variables such as sunlight, air and water are changed. They will work in small groups to analyze findings, synthesize the information from their findings and evaluate the results. The conclusion derived from this project will then be presented in the form of a “claymation” video using Frames software, which is already loaded onto the computers to be used by the students.

Time Frame:
The length of this project is estimated at 16-17 days. (Some days could be combined during the science and language arts in one class day.)

- 1 day (during the science block) of instruction by teacher to introduce the life science standard and growth process of a plant. At this point, the scientific process of planting seeds, mixing up variables, and presenting results through a claymation video will be introduced.
- 1 day (during the science block) for the expert visit to talk to the students about growing plants.
- 1 day (during a block of time booked on the media center computers since each student would have his/her own) to do internet research on the life cycle of a plant.
- 1 day (during the science block) in the science lab to plant seeds in soil.
- 1 day (during the science block) to assign small groups and decide which variables each group should “mix up”.
- 5 days (during the science block) for observations and recording of findings on growth when variables have been applied or deprived. Hypotheses will be developed during this time after 3 days and tested as the project progresses.
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- 3 days (during language arts block) for instruction on the proper use of document camera, Frames program (including more examples of claymation videos) and time for practice making clay figures, creating a setting, using document camera, recording onto Frames.
- 1 day to do a final observation, record findings, test hypotheses, make conclusions based on data.
- 1 day (during language arts block) for making storyboards.
- 2 days to create videos, including voicing over and finalizing movie.
- 1 day for sharing with peers, other classes, school (on morning news).

Standards Assessed:
Nets S Standards:

Content Area State Standards:
S1L1. Students will investigate the characteristics and basic needs of plants and animals.
   a. Identify the basic needs of a plant.
      1. Air
      2. Water
      3. Light
      4. Nutrients
   b. Identify the basic needs of an animal.
      1. Air
      2. Water
      3. Food
      4. Shelter
   c. Identify the parts of a plant—root, stem, leaf, and flower.
   d. Compare and describe various animals—appearance, motion, growth, basic needs.

CCSS.ELA-Literacy.RL.1.7 Use illustrations and details in a story to describe its characters, setting, or events.

CCSS.ELA-Literacy.W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).

Learner Objectives:
Students will exercise critical thinking skills by conceptualizing the basic needs of a plant to grow and thrive, apply knowledge from instruction and prior experiences to form hypotheses, analyze growth patterns based on variables, synthesize and record data, evaluate the information to test hypotheses and reach a conclusion about what a plant needs to live.

Students will develop presentation and technology skills by using various digital tools such as document cameras, computers with Frames software, to produce evidence of their findings to share with others and among peers.

Introduction or “hook”:
The “hook” will be the examples of “claymation” movies on YouTube and having them think about how a movie is made by single frames that are sped up. A sticky-note video will be shown first followed by tutorials by Tech4Learning as well as short clips from “Gumby” and “Pingu” cartoons and claymation films made previously by former students at Tech Camp this summer. This introduction should excite and motivate the students.

This will probably be the first time for most of the first grade students to use the scientific process and the process in itself should allow them to participate, collaborate with peers, and practice higher-level critical thinking skills.

Process:
The classroom teacher will introduce the life science standard and growth process of a plant. Students will review the parts of the plant and be able to identify the basic needs of a plant as air, water, light, and nutrients at the end of this lesson. Students will conduct research on the Internet about the life cycle of a plant and they will complete a Kidspiration template by filling in the simple stage of the life cycle of a plant. (Kidspiration is a program that is loaded on all computers in the school – a template for this project will be set up ahead of time by the teacher). The following steps of a simplified scientific inquiry process will also be introduced and connected to the upcoming project:

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Step 1: Ask a question: What would happen to a seed if it were planted in soil and deprived of air, water, nutrients, or sunlight? (Each small group will change variables in a different way.)

Step 2: Make a hypothesis: Based on what they learn from the gardening expert, research on the internet and the textbook as well as instruction by their teacher, small group members will collaborate to decide what they think will happen based on which element they’ll be depriving their planted seed of during the growth process.

Step 3: Conduct an experiment: Students will work with master gardeners to plant their seeds, apply or deprive their plant of the variable decided upon earlier in the process and will spend the next five days observing it and recording what it happening each day to their planted seed.

Step 4: Collect data: Students will record what it happening each day to their planted seed. They will record how their plant looks, feels, and anything else they observe about their plant. Students will make a graph showing daily progress of their plant’s appearance in the Graph Club program, which is loaded onto all computers in the school. (Students have previously gained experience in this program in Kindergarten and during the year in first grade.)

Step 5: Analyze information: At the end of the designated growth period, students will analyze their collected data to decide whether or not their hypothesis held true and will determine why or why not it was correct. Thus, evaluation will take place and a conclusion will be made about how the variables that were applied affected the life of their plant.

Step 6: Report results: Students will make an animated film using clay “characters” to present their results using Frames software to tell the story of their plant from the perspective of the plant.

- Students will set up a graphic organizer in Kidspiration to be filled in as the scientific process is ongoing and saved as each step is completed.
- The introduction lesson will immediately be followed by a project introduction by the media specialist laying out all the steps to come in the next two weeks. A rubric will be shared with the students and sent home to parents.
- At this point, the expert visits from the County Extension service to talk to the students about growing plants in our geographic region.
- Then, volunteers from the Master Gardeners’ Club visit students in the science lab to assist them in planting seeds in the soil. (The volunteers will be told the details of the project before their visit.
- Teacher will then assign small groups and they will work together to decide which variables their group will “mix up” to affect the growing process.
- Based on what they learn from the gardening experts, individual research and instruction by their teacher, small group members will collaborate to decide what they think will happen based on which element they’ll be depriving their planted seed of during the growth process. Hypotheses will be developed during this time after 3 days and tested as the project progresses and recorded in their Kidspiration template.
- Students will make observations and record their findings about the appearance, texture, and general well-being of their plant during the growth period when variables have been applied or deprived and will be recorded on a clipboard and transferred into a graph in the Graph Club program to visually display their data collected upon observation.
- The media specialist will demonstrate the proper use of document camera, introduce the Frames program (including examples of claymation videos) and give students time to practice making clay figures, creating a setting, using document camera, recording onto Frames.
- Students will make a final observation, record their findings, test their hypothesis, and make conclusions based on data.
- Students will then begin work on presentation by planning their story. Small groups will work together to make storyboards to illustrate each scene. Teachers will guide and facilitate small groups through this planning stage by brainstorming with them for ideas and to be sure all story elements are included. Students will collaborate to decide what role each group member will play in the movie-making process.
- After a review of using the Frames program by the media specialist, students will work in small groups to create “characters” out of clay, use the document camera to take individual frames moving characters in each frame slightly to depict “movement”.
- When satisfied with their frames story, students will record their voices in a quiet room over each frame. Adult will assist them in “stretching” the frames to appropriately fit their words into the story. Music will be added, if necessary, for aesthetic value and movie will be finalized and saved.
- Assessment will be done throughout the process by the teacher during various stages of the process as formative grades and a summative grade will be given at the end of the week based on the rubric. (see Product section)
- The class’ movies will be shared on the morning news that week during the “Science Spotlight of the Week” segment that airs one morning a week. (Other highlighted features are on other days at Whitlow such as “Principal’s

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Spotlight of the Week”, “Wolf Caught in Action”, “Green Team Message of the Week”, and “Olweus Message of the Week”. The class will also have a sharing time among themselves as a class before airing on the news.

Product:
A “claymation” video depicting how a plant grows from a seed, from beginning to end, and how variable manipulation (such as improper care or lack of sunshine, etc.) will affect the growth process based on prior knowledge, scientific processing and instruction. The movie will be narrated by students and told from the perspective of the plant. The following table outlines the standard/objective, student task, technology used, and assessment for each step of the project:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Student Task</th>
<th>Technology Used</th>
<th>Assessment</th>
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<tbody>
<tr>
<td>CCSS.ELA-Literacy.W1.7 S1L1 Nets S Standards: 2) Communication and Collaboration; 4) Critical Thinking, Problem-Solving &amp; Decision-Making; 5) Digital Citizenship; 6) Technology Operations and Concepts</td>
<td>Students will conduct web-based research on the life cycle of a plant and record findings on a pre-designed template in Kidspiration. Research will be individually and compiled as a group to fill in one Kidspiration template.</td>
<td>-Internet -Computers -Kidspiration</td>
<td>Kidspiration template for each small group will be graded as a formative assessment for accuracy of information and collaboration.</td>
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<tr>
<td>S1L1 Nets S Standards: 2) Communication and Collaboration; 4) Critical Thinking, Problem-Solving &amp; Decision-Making; 5) Digital Citizenship; 6) Technology Operations and Concepts</td>
<td>Students will set up a graphic organizer in Kidspiration on which to record data found during the scientific inquiry. (Asking a question, making a hypothesis, conducting experiment, collecting data, Analyzing information, and reporting results.)</td>
<td>-Kidspiration -Computers</td>
<td>Kidspiration template for each small group will be graded as a formative assessment for accuracy of information and collaboration.</td>
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<tr>
<td>S1L1 2) Communication and Collaboration; 4) Critical Thinking, Problem-Solving &amp; Decision-Making; 5) Digital Citizenship; 6) Technology Operations and Concepts</td>
<td>Students will plant a seed in soil with assistance from gardening experts and decide which variables they will apply ( ex. No sun, no water, no nutrients, lots of water, etc.) and record it in Kidspiration graphic organizer in the “ask a question” bubble stating “What will happen to my plant if...?&quot;</td>
<td>-Kidspiration -Computers</td>
<td>Teachers will walk around and assess informally that all groups have planted their seed properly and have worked together effectively. Kidspiration template for each small group will be graded as a formative assessment for accuracy of information and collaboration after each entry is made.</td>
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<tr>
<td>S1L1 Nets S Standards: 2) Communication and Collaboration; 4) Critical Thinking, Problem-Solving &amp; Decision-Making; 5) Digital Citizenship; 6) Technology Operations and Concepts</td>
<td>Students collaborate with peers in their small groups to make a hypothesis and record that statement in the Kidspiration graphic organizer.</td>
<td>-Kidspiration -Computers</td>
<td>Kidspiration template for each small group will be graded as a formative assessment for accuracy of information and collaboration after each entry is made.</td>
</tr>
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<td>S1L1 Nets S Standards: 2) Communication and Collaboration; 4) Critical Thinking, Problem-Solving &amp; Decision-Making; 5) Digital</td>
<td>Students will collaborate to apply variables (or not) to their plant on a daily basis. Students make observations and record them on a clipboard and then transfer</td>
<td>-Graph Club -Kidspiration -Computers</td>
<td>Teachers will formatively assess daily progress of each group’s completed graph after data is collected. Teachers will also formatively assess each</td>
</tr>
</tbody>
</table>
| Nets S Standards: | Students will practice with Media Specialist/teacher/ITS using the document camera properly, using the Frames program effectively, including recording their voices onto the frames. They will also practice forming the clay into figures and decide what materials will be needed for the setting of their story. | -Document camera for each small group  
-Frames program  
-Laptop computer for each small group (with built-in microphone for recording) |
|------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| CCSS.ELA-Literacy.W.1.7  
CCSS.ELA-Literacy.RL.1.7 | Students will create a storyboard of their plant’s experience (from the experiment above) to be told from the perspective of the plant. This will serve to plan the frames to come in their “claymation” story. They will collaborate within their small group to decide what job each group member will have in the upcoming process. | Teachers will assess informally on collaboration as well as their completion of storyboard plan. He/she will facilitate the process by brainstorming with each small group and guide them with ideas for the story or presentation of their experiment. |
| CCSS.ELA-Literacy.W.1.7  
CCSS.ELA-Literacy.RL.1.7  
Nets S Standards: | Students will create a “claymation” movie in the Frames program as a final project to showcase to the school, classmates, parents, and teacher. | Teachers will give a summative assessment, based on the rubric supplied at the beginning of the project, on the final product for each small group. |
| Nets S Standards: | Students will share their movies with the school on the daily morning news program that is broadcasted daily to every classroom. | -Closed-circuit television access to daily news program for school |

**Technology Use:**
Students will use the Internet for research on the life cycle of a plant with desktops in the media center provided by our school. Students will use laptops from one of the school’s laptop cart that has the Frames software loaded onto them as well as the built-in microphone to record. They will be using the Kidspiration program for the research process as well as the
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scientific inquiry process to organize their information. They will be using the Graph Club program to display data from the observation process. They will also be using document cameras to capture the pictures for their movie frames. Students will be using the Promethean interactive whiteboard to present their final product to peers in the class.

References and Supporting Material:

A rubric will need to be made for this project on collaborative work, multimedia presentation, and scientific process (teacher and media specialist should collaborate on this rubric).

Examples of frames and claymation videos:

Flip book sample video:
http://www.youtube.com/watch?v=FH97UerMW6I&feature=share&list=PL9241B1574C3838B8

“Gumby” sample video:
http://youtu.be/CWYYkF6DOnk

“Pingu” sample video:
http://youtu.be/g0ETq0N003k

Websites for research on life cycle of plants:

http://www.brainpopjr.com/science/plants/plantlifecycle/grownups.weml

www.brittanicaelementary.com

http://www.kidsclick.org/

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