

Best Practices of Technology Integration

Title: QuickTime Science Project

Submitted by:

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Subject Area: Language Arts/Science/Technology

Intended Grade Level(s): 5th Grade

Description:

The ability to communicate ideas using multimedia will continue to become more and more important. This project gives the students the opportunity to combine the written word with a visual explanation to produce a multimedia project. To be successful with the project, the students need to make a model of the concept they are illustrating so that they can videotape it in action. They need to understand their topic well in order to build a model and in order to explain it in writing. Their end project combines all their knowledge in a product similar in concept to what they have used in commercial programs. It gives them a project that they can really get into and a product to be especially proud of.

Narrative:

Given the equipment and time and supplies needed, the project will generally work better when the class is divided into teams. The teams will select a simple science topic to explain and illustrate. They should pick a topic that they can illustrate with a very short (about 15-20 seconds) video clip, or QuickTime movie. For example, gears, an inclined plane, levers, wheel and axles, screws, wedges, magnets, or a pulley.

They will write a brief (one page or less) explanation of their topic (for example, how gears work) in Claris Works and insert their QuickTime movie so that someone reading their explanation on the computer can then click on their movie and see a movie illustrating their topic. It could be similar to multimedia encyclopedia's that have narration with a QuickTime illustration. They will also print out their report.

Their goals will include understanding a scientific concept, explaining this concept clearly and briefly, illustrating this explanation, learning how to make a simple QuickTime movie and using it to make a multimedia presentation, and working together as a team.

Curriculum Benchmarks:

MI.ELA.1.LE.1 Use reading for multiple purposes, such as enjoyment, gathering information, learning new procedures, and increasing conceptual understanding.

MI.ELA.2.LE.1 Write fluently for multiple purposes to produce compositions, such as stories, reports, letters, plays, and explanations of processes.

MI.ELA.11.LE.4 Using multiple media, develop and present a short presentation to communicate conclusions based on the investigation of an issue or problem. Examples include charts, posters, transparencies, audio tapes, videos, and diagrams.

MI.SCI.1.E.3 Manipulate simple mechanical devices and explain how they work. (Key concept: Names and uses for parts of machines, such as levers, wheel and axles, pulleys, inclined planes, gears, screws, wedges. Real-World contexts: Simple mechanical devices, such as bicycles, bicycle pumps, pulleys, faucets, clothespins.)

Total amount of time for lesson:

The total time will depend on equipment availability, individual skills of the students, the ability of the students to work well together as a team, the difficulty of the concept they choose, and how the teacher chooses to set it up. Keeping it simple will reduce the potential for frustration and the length of the project. The students need a short time for each team to select a topic. They will need to research how their concept works (the book, The Way Things Work, would be useful), build it using everyday supplies or possibly Lego type materials, videotape it, write it up, type it, and insert their movie clip as a QuickTime movie. Some of this would have to be done in the classroom or in the computer lab, but other parts of the project could be done as homework.

Given all of this, a rough and high estimate follows:

Selecting a topic, researching it, sketching a design to illustrate the concept and writing up a list of materials necessary to build it — 1-2 hrs.

Building the model — 1 hr.

Writing a draft explanation of the concept, editing and polishing the draft — 1–2 hrs.

Typing a final copy of the explanation — 30 minutes

Videotaping the model illustrating the concept— 30 minutes

Capturing the video on the computer (could be done by the teacher) — 15 minutes

Editing the tape within a video editing software program or within QuickTime and publish as a QuickTime movie — 15-30 minutes

Inserting the QuickTime movie into the typed document in an appropriate position — 15 minutes.

Materials/Hardware/Software:

The materials for their models depends on what concept they choose to illustrate. For example, a pulley could be made with string and a spool of thread and an inclined plane could be made with books or blocks and piece of scrap wood.

Computers, more if possible to allow more than one team to work at a

time. A Power Macintosh, G3 or iMac or comparable windows machine should be used. Considerable RAM (min. 16 if using virtual memory) and the speed of these machines makes the project easier to do. The computer needs to be able to capture video. Claris Works 5.0 (Apple Works) and QuickTime or similar software that allows the insertion of a QuickTime movie is required. Ink jet printer or a Laser Writer. A camcorder is needed to record the demonstration. Video or S video cables to connect the camcorder to the computer to transfer the video. Paper for printing their reports

Teacher Preparation:

The teacher needs to divide the class into working teams and discuss the project with them. The teacher then needs to be available to assist them as they work on their project, both with ideas, technical expertise, and perhaps classroom items for building their models. To better assist the students, the teacher needs to learn how to put together a Quick Time movie and insert it in the word processing program if they don't already know how.

Prerequisite Student Skills:

The student's ability to type will greatly assist them in getting the typing part of the project done. Skills that are useful but can be acquired during the project include writing, editing, videography, model building, research, and teamwork.

Student Activities/Procedures:

1. Select a topic and research it to make sure the students understand it well.
2. Sketch a design to illustrate the concept and write up a list of materials necessary to build it.
3. Build the model.
4. Write a draft explanation of the concept. Edit and polish the draft.
5. Type a final copy of the explanation.
6. Videotape the model illustrating the concept.
7. Edit the tape within a video editing software program or within QuickTime and publish as a QuickTime movie.
8. Insert the QuickTime movie into the typed document in an appropriate position.
9. Save and print.

Assessment/Evaluation:

The project could be graded as follows:

Rough Draft: 0-20 pts.

Research your topic, if necessary, and write out a rough draft to bring to the lab. Also sketch out how you are going to demonstrate your topic and list the items you will need to do this. (For example, Lego's, gears, pulleys, string, spool, wood, books.)

Presentation: 0-10 pts.

Put your name, teacher and date on three lines in the top right hand corner. Skip 2 lines, center your title and put "by" followed by your names on the next line. Skip 2 lines. Indent

your paragraph (using the indent on the ruler) .5 inches and begin typing your report. Insert your Quick Time movie where it's appropriate.

Concept and Creativity: 0-10 pts

Be creative in your explanation and demonstration. Make it interesting in the same way that you would want to be taught in an interesting way.

Organization and Promptness: 0-10 pts.

Don't put off this project. You should work on it outside the computer lab (or away from the computer) so that your time in the lab (or on the computer) is better spent in putting it all together.

Content: 0-25 pts.

Explain your topic clearly and briefly. Think of this as a brief entry in an encyclopedia, like you might find in a multi-media encyclopedia. Feel free to look at one of the CD's we have for examples. Proof read and spell check your work. Correct grammar, use proper paragraphs and topic sentences.

- **Quick Time Movie: 0-25 pts.**

Set up a demonstration that you can videotape.

Videotape it.

Edit it on the computer (can be one single shot or a short series of shots) for length.

Publish it as a Quick Time movie.

The ability to perform all the steps and produce a product even if, for example, the QuickTime movie is a bit unpolished, is a worthy accomplishment.

One of the purposes of this project is to promote teamwork, so the team could also be evaluated on how well they are working together with the following rubric:

1= Excellent & outstanding. Your entire group was on task the entire time and getting along. Decision-making was done as an entire group.

2= Above average. Most (at least 3 out of 4-5 members) of your group were working hard, and on task most of the time. Most of your group was getting along.

3= Satisfactory. Some (at least 2 members) of your group were working hard, and on task some of the time. Some of your group members were getting along.

There is room for your group to improve.

4= Unsatisfactory. One member of your group was working hard. The remainder of the group was unfocused, talking, arguing, and not working. Your group MUST improve!

Follow-up Activities:

The print outs of their projects could be hung on the walls and the reports made available on the computer for parents to view during Open Houses or Conferences or Technology Nights. The reports could also be produced in one document and burned onto a CD for later use by other classes (for research examples for future fifth grades or for the lower grades) or used as part of an electronic portfolio for the students.