

LESSON PLAN - Monitoring Change

Step by Step Instructions

During instruction, adhere to a gradual release of responsibility. First, explain and model the strategy for students (me) and then have the class complete the strategy together (we). Next, put students into pairs to practice the strategy (two), and finally, have the students work independently to complete the strategy (you).

Engage (me):

Read: Go to the Platte Basin Timelapse site <http://plattebasintimelapse.com/learn/monitoring-change/>

Read/View: Have the students begin reading Chapter 1 entitled Time-lapse.

<http://plattebasintimelapse.com/ed/chapter/timelapse/>

View: Watch the short time-lapse video examples provided on the page and read the short stories that accompany them. These include: Platte Cropfield, Lied Bridge, Rowe Tower, Mormon Island, Jack Creek, Sunshine Beach, Fremont Canyon.

Explore (we/two):

Discuss the following synthesis questions prior to exploring the learning object activity: "Do It Yourself"

1. How does the video Platte Cropfield demonstrate a watershed?
2. After watching the Lied Bridge video, why is the Platte River described as a *dynamic* river?
3. What patterns did you notice in the large numbers of birds in the video from the Rowe Sanctuary?
4. Mormon Island is a unique area that supports a wide variety of organisms. You can see some of the organisms easily in the video, yet after watching the video you should notice it changes frequently throughout a single year. What kinds of animals and plants could live in the Mormon Island area due to the extreme changes that happen?
5. Once you have seen the Jack Creek time-lapse, explain why the water levels in the creek increase so dramatically and then decrease just as dramatically over a single year?

Time: 30-60 min.

Materials:

(See: *Do It Yourself*)

- any kind of camera
- simple hardware to create a fixed camera point
- computer with photo or movie editing software

Grade Level:

Upper Elementary & Middle School

Subjects:

Science, Technology, Engineering, Math

Standards/Indicators:

Next Generation Science Standards:

- MESS2-2
- MSLS4-1
- HESS2-2
- HSLS4-5

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6. The Sunshine Beach time-lapse video illustrates how humans regulate water levels in reservoirs. After seeing the increase and decrease in water levels in the reservoir, hypothesis why the levels are continually increased or decreased?
7. Fremont Canyon is a clear image of a dam holding back water to create a reservoir. In the video you will notice there is a minimum amount of water leaving the right side of the canyon near the bottom of the dam. However, the amount of water increases dramatically throughout the year. Explain why the amount of water released below the dam varies throughout the year AND what is significant about the overflow of water in the beginning of the video?

Explain (two/you):

Once students have viewed time-lapse videos, explore the nuts and bolts of how the Platte Basin Timelapse Project uses the power of photography and storytelling to show where our water comes from and to see a watershed in motion.

Read: Have the students read Chapter 2 entitled “How We Do It”

<http://plattebasintimelapse.com/ed/chapter/how-we-do-it/>

View: Watch the time-lapse video of the PBT Team installing a camera on location.

View: Watch the career video about PBT co-founder Michael Forsberg “Beyond Plain Sight.”

Elaborate (you):

Read: Have the students read Chapter 3 entitled “Do It Yourself”

<http://plattebasintimelapse.com/ed/chapter/do-it-yourself/>

Do It Yourself activity explained:

Students will create their own time-lapse projects. This activity supports the Explore, Explain, Elaborate and Evaluate sections of the lesson.

What you’ll need:

1. Any kind of camera.
2. Simple hardware to create a fixed camera point.
3. Computer with photo/movie editing software.

Basic steps:

1. Choose your subject
2. Choose your composition
3. Choose your interval between shots and total observation time.
4. Shoot your still photographs.
5. Review your collection of photographs.
6. Assemble all of your photos together into a video, photomontage, or other format.
7. Add titles, music, etc. (optional).
8. Share your end product with your class (see evaluate)

Choose your subject:

There are endless subjects to explore over time. Creating a time-lapse for the first time involves getting out there and trying it out! Here are a few examples to get you thinking:

- Sunrises or sunsets
- The night sky
- A tree branch budding and blooming
- A garden growing over a season
- One plant in a garden over a season
- Fruit rotting/ice melting
- Human activity; a street scene or inside a crowded building
- Construction of a building
- A tree changing colors and dropping leaves in the fall
- Stream levels

The most important parts for a beginner are selecting a subject and an appropriate composition — or scene — to tell a story of change over time. What do you anticipate? What do you want to reveal? Is the subject big, like a landscape? Or small, like a bird nest? The answers to these questions will illustrate your subject and your scene.

The interval — time between shots — is up to you and what you want to show. What would happen if you took pictures of a sunrise every minute for an hour? What if you took a picture of a tomato plant every day for a month? The best way to figure out an appropriate interval is to get out there and try it! The interval length might depend on how often you can make it to the spot that you’re observing.

Your observation time will vary according to your subject, your interval time and the overall story you want to tell. In planning a time-lapse project, ask yourself how much time you have to commit. It’s all about trial and error until you get it right. To see the entire growing season of the community garden, we planned to take pictures from April to October. What do you think is the right formula for your story?

How to evaluate media:

Use the Media-Making Rubric developed by our friends at KQED on page 5-7.

Elaborate (you):

Chapter 4: Citizen Science

<http://plattebasintimelapse.com/ed/chapter/citizen-science/>

Read: Have students read Chapter 4 and then follow the embedded links to explore examples of citizen science projects. **Visit:** [BioBlitz](#), [Project BudBurst](#), [BugGuide](#), [FrogWatch USA](#), [NestWatch](#), [Earthdive](#)

This lesson provides a glimpse into how time-lapse photography can be a powerful tool for citizen science, making it possible to monitor and share visual observations about change over time, provoking questions to inspire future investigation.

Evaluate (you):

Students now will share their photos and/or time-lapse videos with peers. Scientists must do peer reviews of their work, which means showing the work with others. Each student must explain why he/she chose the specific subjects and justify choices to others. Use the following rubric (may need modified) for students to evaluate each other's project as well as their own. See attachment *RubricforSlideshow-andVideo* document.

Finally students will complete the following essay reflection on their project.

Platte Basin Timelapse Reflection Essay

Today you will have a full 30 minutes to write your answers to the following four questions. Tomorrow you will have 30 minutes to reread, reorganize and revise your ideas into a coherent essay. Please cover all four questions to the best of your ability. Make sure that you use examples whenever possible.

Once you start writing, you may use dictionaries and other writing aides, but **YOU MAY NOT DISCUSS YOUR WRITING WITH ANYONE.**

Resources

The use of the following resources is recommended.

<http://monitorchange.org/>

[BioBlitz](#)

[Project BudBurst](#)

[BugGuide](#)

[FrogWatch USA](#)

[NestWatch](#)

[Earthdive](#)

Meta Tagging

Citizen science, conservation, scientist, field work, time-lapse, watershed, human impact, hypothesis, wetlands

1. Describe how the time-lapse project you created made a difference in your understanding of Ecology [insert whichever unit or topic this falls within in your curriculum].
2. What long-term benefits could the project [again name of kids' project] provide to you?
3. How did you apply what you had already learned in school to the project?
4. What skill have you gained from the project that may help you become a better citizen toward Nebraska's Water Resources?

Media-Making Rubric: Slideshow/Video

Mix and match the categories and benchmarks below to make a rubric that fits your needs. Share your expectations with your students as they begin their projects.

INTRODUCTION

Exemplary	Proficient	Partially Proficient	Incomplete
Unique and memorable introduction engages the audience immediately and communicates the purpose of the piece.	Introduces the topic and purpose in an engaging manner.	General introduction of the topic and purpose. Little creativity and only somewhat engaging.	Introduction is not included or does not make sense. The topic and purpose are not clear.

DELIVERY

Exemplary	Proficient	Partially Proficient	Incomplete
Narrator sounds comfortable with the content. Words are clear and pacing is appropriate.	Narrator has a fairly smooth delivery. Words are clear and pacing is appropriate.	Narrator sounds like s/he is reading. Words aren't always clear and/or pacing is uneven.	Delivery interferes with ability to understand or follow the piece. Words often aren't clear and pacing is irregular.
Correct grammar is used consistently.	Grammatical mistakes are few.	There are several noticeable grammatical mistakes.	Grammatical mistakes interfere with ability to understand the piece.

TECHNICAL PRODUCTION

Exemplary	Proficient	Partially Proficient	Incomplete
Smooth transitions throughout piece. No dead space.	Transitions are smooth, but dead space is occasionally heard.	There is distracting dead space and/or ambient noise. Transitions are uneven.	Much of the piece has distracting background noise. Transitions are jumpy.
Audio volume complements the presentation.	Volume is acceptable.	Volume is inconsistent.	Volume changes are highly distracting.
Length of the media piece was appropriate.	Piece would benefit by being more concise or including more explanation.	N/A	Piece doesn't follow teacher guidelines for length of the media.

IMAGES/GRAPHICS

Exemplary	Proficient	Partially Proficient	Incomplete
The graphics and images contribute to a creative and effective presentation and enhance key points by contributing to the concept explanation.	The graphics relate to the audio and help communicate the content.	The graphics do not consistently relate to the audio or help communicate the content.	The graphics don't relate to the audio and distract from the science content.
All shots are in focus and nicely cropped. The camera work is smooth and steady.	Most shots are in focus and nicely cropped. The camera work is fairly smooth and steady.	Most shots are in focus, but pictures need additional cropping. Some camera work is shaky or unsteady.	Many shots are out of focus or need additional cropping. Shaky or unsteady camera work is distracting.
All images and/or audio were either created by the producer or have appropriate evidence and documentation for copyright clearance.	All images and/or audio have either been created by the media producer or are copyright cleared. Appropriate evidence and documentation for copyright clearance is missing.	Use of copyrighted works is problematic.	Copyright infringement is obvious.

CONTENT

Exemplary	Proficient	Partially Proficient	Incomplete
Creativity and original content enhance the purpose of the piece in an innovative way.	Creative elements are included, but don't enhance the purpose of the piece.	Creativity is lacking or creative elements sometimes distract from the content or purpose of the piece.	No creative elements are included, or the types of creative elements used are inappropriate or distract from the content and/or purpose of the piece.
High level of science concept understanding is apparent. Information is accurate and thorough, but concise.	Information is accurate.	Some information is unclear or rambling.	Information is inaccurate.
The scientific terms used are appropriate for the content, explained well and enhance the piece.	Scientific terms are included and defined.	Scientific terms are included, but they are not explained or their meaning is unclear.	Scientific terms are not included.
The intended audience would learn something from the piece and find it valuable.	The piece is appropriate for the intended audience.	The piece is lacking elements or is a little too complex for the intended audience.	The content and language of the piece is not appropriate for the intended audience.

GROUP/PARTNER WORK

Exemplary	Proficient	Partially Proficient	Incomplete
Group members collaborated and participated equally in development of the project.	Group members participated equally, but there was not much collaboration or sharing of ideas.	All group members contributed, but in unequal proportions. A few members did the majority of the work.	Some group members did not contribute to project ideas or discussions.
Completed assigned tasks and shared insights and skills with the group.	Completed assigned work.	Completed some of the assigned work, but relied heavily on others to complete the project.	Did not complete assigned work.

CREDITS

This rubric was adapted from **Rubric for Podcasts** <http://www2.uwstout.edu/content/profdev/rubrics/podcastrubric.html> by Ann Bell under the [Creative Commons Attribution-Noncommercial 3.0 United States License](https://creativecommons.org/licenses/by-nc-sa/3.0/).

ABOUT THE TOOLKIT

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This resource is a component of the Media-Making Toolkit for Science Education, developed by KQED Education. The Toolkit includes instructions, worksheets and rubrics to assist educators in implementing media-making projects with students.

For a complete listing of the resources in KQED's Media-Making Toolkit, please visit www.kqed.org/education.