



Computer Animation

A Vehicle for
Creative Problem Solving



Michelle H. Smyth

The WEB Project

May 2000



Special thanks to Fern Tavalin, Anne Hamilton, Michael Hanish
and all the students who inspired this unit.



This booklet has been sponsored by the WEB Project, a US Department
of Education Technology Innovation Challenge Grant.



Smyth, Michelle H. (2000). Computer Animation--a Vehicle for
Creative Problem Solving. Available: <http://www.webproject.org>



Copyright © 2000 The WEB Project. All rights reserved. Permission to copy
for educational purposes only. Please credit source.



Animation and creative problem solving

On the surface this handbook is a step by step guide to building a three-week unit on cel animation. Looking deeper, it also describes a process for creating a dynamic classroom where a teacher guided introduction leads to intensive student directed learning.

The lessons, activities, and production phases of the program are carefully crafted to: emphasize art as a form of communication, foster the collaboration and planning found in the workplace of professional animators, and create an environment for creative and analytic problem solving as technology is integrated into a visual arts program.

The structures that underlie this animation program are:

- a planning process
- a set of behavioral expectations
- vocabulary to articulate goals
- concrete checking to make sure that each student understands the basic concepts
- clear criteria for assessment
- a limited tool set
- a built-in infrastructure for self-direction.

These are the elements that when tied together foster analytic problem solving and allow students to express themselves creatively.



Table of Contents

Introduction: Animation and creative problem solving

Classroom setting.....	1
Unit overview.....	1
Activities, Products and Performances.....	2
Assessments used.....	2
Standards.....	3
Unit Time Line.....	4
Unit process.....	5-19
History of film and animation	5-6
The flipbook.....	7-8
The camera shot.....	9-10
Establishing criteria for assessment/creating rubrics.....	10-11
Brainstorming a storyline.....	12-13
Storyboarding.....	14-15
Introduction to software.....	16
Beginning production/review of concepts.....	17
Production.....	18
Critique and reflection.....	18
Formal assessment.....	19
Appendix A: Handouts and Worksheets.....	21-26
Appendix B: Rubrics.....	27-30



Classroom setting

The unit has been used extensively with seventh graders in a middle school in the Northeast Kingdom of Vermont whose prior experience with computer graphics was minimal. Five or six computers were used during the production phase. Students worked in groups no larger than three. Class size was generally 15-18 students.

Unit overview

This unit is constructed to build on analytic skills as students gain concrete knowledge, design, create and revise a computer animation. Initial activities are carefully introduced to build upon each other in order to provide a progressively complex basis for self-directed problem solving. Due to its foundation in the Vermont Framework's Artistic and Communication Standards as well as problem-solving standards from the Vital Results, this computer animation unit of study easily adapts and is transferable to a variety of teaching situations and software applications. Software is chosen for its connection and demonstration of concepts rather than its sophistication in product results. The software choice needs to unmask the underlying concepts and have a direct link to the standards and learning objectives in order to be a valuable teaching resource for this unit.

Collaboration is also a vital component of this unit's design. Students work together in small groups to plan and create computer animations. A significant part of this unit is devoted to gaining background knowledge in concepts and in planning focused on clear communication and purpose. As students utilize standards for communication in the field of film and animation, creative collaboration can flourish because students learn objective methods for analyzing their process as they create. Group decisions are based on plans and overall intent so that when the technology is integrated it acts as a vehicle for their artistic message.

Activities, Products and Performances

1. Students create a flipbook to show an understanding of persistence of vision.
2. Students work in groups of 2 or 3 to create a storyboard that includes effective use of camera shots, timing and a complete storyline.
3. Working in groups, students use the computer to create a computer animation. Production decisions must be based on communication of a storyline, effective use of camera shots, clarity of drawings and the smoothness of frame by frame movement.

Assessment

Assessment is imbedded throughout the unit. Concrete activities during the first part of the project provide the instructor and students with direct feedback of the students' understanding of general principles. Once ample background knowledge is obtained, student generated rubrics act as guidance for performance in: product quality, group interaction, and individual accountability.

Assessments tools used

1. **Conferences** with students throughout the animation process act as guidance and a resource.
2. **Informal group analysis sessions** held to reflect on techniques used within student work.
3. **Student reflection sheet** filled out by each individual during the middle of the production phase.
4. **Concept review sheet** is filled out before students begin to plan animation.
5. Product, Approach to Work, and Group Interaction are formally assessed using **student-generated rubrics** as guidance.

Standards

Several Standards from Vermont's Framework of Standards and Learning Opportunities support the unit:

Vital Results

Expression/Artistic Dimensions 1.16

Students use a variety of forms, such as dance, music, theater, and visual arts to create projects that are appropriate in terms of the following dimensions:

Skill Development

Projects exhibit elements and techniques of the art form, including expression, that are appropriate to the intent of the product or performance.

Reflection and Critique

Students improve upon products and performances through self-reflection and outside critique, using detailed comments that employ the technical vocabulary of the art form.

Approach to Work

Students safely approach their media, solve technical problems as they arise, creatively generate ideas, and cooperate with ensemble members where applicable.

Problem Solving Process 2.2

Students use reasoning strategies, knowledge and common sense to solve complex problems related to all fields of knowledge.

Fields of Knowledge

Arts, Language and Literature Standards

Literature and Media

5.15 Design and Production

Students create media products, which successfully communicate.

Elements, Forms, and Techniques in the Arts

5.28 Artistic Proficiency

Students use art forms to communicate, showing the ability to define and solve artistic problems with insight, reason, and technical proficiency.

Unit Time Line

This unit lasts from 15-18 days, designed around a 42-minute art period. The time frame is flexible however, and can be easily adapted for classes that extend in length or duration.

Day 1	History of film and animation
Day 2	The camera shot
Day 3	Overview of the animation process
Day 4	Establishing criteria for assessment/creating rubrics
Day 5	Brainstorming a storyline
Days 6-7	Storyboarding
Days 8	Introduction to software
Days 9	Beginning production/review of concepts
Days 10-14	Production
Day 15	Formal assessment

Day 1: History of Film and Animation

Initial immersion in content knowledge

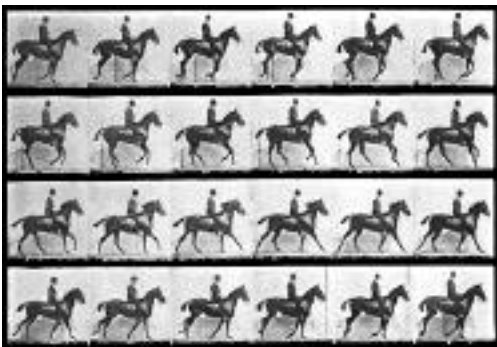
Equipment/support materials

- Filmstrips
- Film projectors
- Examples of motion machines
- Picture of zoetrope or other early motion machine
- Pictures from Muybridge's photographic studies of movement

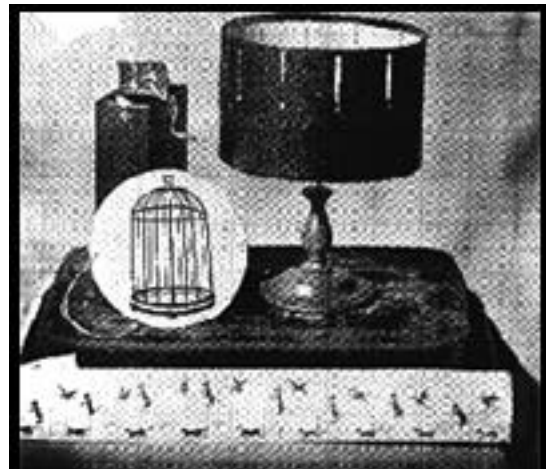
Concepts

The first day of this unit is devoted to understanding the historical context and the rudimentary concepts behind film and animation. Muybridge's photographic studies of frame by frame isolation of objects in motion lead to our understanding of how to create the illusion of movement in film. This concept, (called "persistence of vision") is the foundation of moving pictures. Persistence of vision is a scientific principle that was being explored throughout the Western World during this time of technological advancement in photography. Individuals studying this phenomenon struggled to invent and understand methods for transforming still photography into action film that could more accurately emulate real life experiences.

Photographic Study by Muybridge



A Zoetrope



Concepts we now take for granted were puzzles a little more than 100 years ago. For emphasis, I begin with this story:

Muybridge was a British photographer who studied motion. He set up trip wires to activate cameras to take numerous pictures of moving objects, both people and animals. In this way, he isolated movements. His experiments came into use for Leland Stanford, a very wealthy man and a horse racer, when Stanford placed a bet with a friend that horses at full gallop become completely airborne. Stanford paid Muybridge \$40,000 to set up an experiment to prove his idea. Muybridge used the funds to take a trip around the country, giving lectures about his motion studies. At one of these lectures, he met Thomas Alva Edison who later went on to create motion picture machines.*

* At this point, I will ask a few students to walk and we try to imagine what it would look like if we took a picture every second or so that would isolate our movements.

Activity

- Creating the Illusion of Motion

Look at early motion machines, pieces of filmstrips and Muybridge's photographs of motion studies. Identify individual frames in film. In order to stress how many frames must go by in order to trick the eyes into seeing movement, students calculate how many frames might be in an average two minute commercial. Using some basic arithmetic (if there are 30 frames in a second of video....)

Analysis/discussion

- How did Muybridge isolate movement? (By using tripwires to trigger cameras as something moved.)
- What is a frame? (One picture in a series of moving film.)
- What are the implications of being able to isolate movement? (It led to the development of using individual frames to emulate movement.)
- How does film work and how do we create the illusion of movement? (The rapid display of sequential frames creates the illusion of movement. This effect is called persistence of vision.)
- What would happen if a few seconds or frames were cut out of the middle of the movement? (It would skip or jump.)

Day 2: The Flipbook

A concrete application of the concepts

Equipment/support materials

- Flipbooks (professional and student-generated)
- Squares of paper for flipbook assignment, 3-4 inches in size and 12 pictures for each student

Concepts

This exercise provides the teacher with a quick way to check each individual's understanding of the fundamentals of persistence of vision. Students also begin to explore composition and movement within the context of frames. It is vital for students to grasp these concepts in order for them to solve complex problems as they progress through the unit.

Activity

- Creating flipbooks

Students examine samples of flipbooks created by amateurs and professionals.

Every student then receives a dozen small squares of 3-4 inch paper and creates a flipbook that shows frame to frame movement. Students choose simple images to draw, altering each frame slightly. When they are finished, the objects should appear to move when they flip the pages.

A Flipbook sequence



Analysis/discussion

- How did the designers create an illusion of space using: composition, horizontal, vertical, or backward and forward motion?
- What seems to happen to an object's size as it gets closer?

Homework activity

For homework on the first night, students watch commercials to observe how different camera angles, perspectives and transitions are used to convey information.

Analysis/discussion

- Describe how one particular camera shot communicates an idea visually.
- How would a different camera shot change the impact or meaning?

Day 3: The Camera Shot

Conscious and deliberate communication of information

Equipment/support materials

- 4 inch squares of paper for each student
- Handouts on camera-shots and comic strips (Appendix 1.a and 2.a)
- Tape and scissors

Concepts

Images portrayed in the media are consciously and deliberately selected. Film, video, and animation use specific techniques to communicate. Camera angles and perspectives can be manipulated to convey different meanings. Close ups are good for emotions, details and facial expressions. Mid-shots reveal action and long-shots convey setting. A filmmaker can use an extreme close up to draw unusual attention to details because this is a viewpoint we normally don't see.

Activities

- Students identify different camera shots
- Students receive the handout (1.a) that shows a cartoon strip of a variety of camera angles and an accompanying handout (1.b) that lists each shot.

In small groups, students quickly cut out each picture of the comic strip.

Students will then try to match the names of general camera-shots with the corresponding images.

- Students create simple viewfinders and explore visual impact from different distances and perspectives.

Students make viewfinders by cutting a small square in the middle of a piece of paper. In the next 3-4 minutes, they walk around the room, looking at things from different points of view. Students will have their first experience as the filmmaker, shifting them from being the viewer (as with the cartoon exercise) to being the director. This experience provides valuable insights for students as they go on to create their own animations.

Analysis/discussion

- What kind of information does each camera shot tell us about the situation?

(See guide on camera shots.)

- Do objects look the same from different perspectives?
- Assessing understanding of persistence of vision

Flipbooks are collected and student's understanding of frame by frame movement is checked.

Day 4: Standards

Establishing criteria for assessment/creating rubrics

Equipment/support materials

- Generic (blank) assessment chart on board and copies for each students

Concepts

After having learned some basics about animation during the introductory period, students are ready to help set assessment criteria for their animations. Involving students in the development of rubrics is carefully planned. Through leading questions and analysis, students identify criteria for creating a successful animation within the context of their knowledge and group structure.

Activity

Three scoring dimensions are drawn from standards in Vermont's Framework, beginning with Quality of Animation (Product). Students are presented with a blank chart with empty categories showing different levels of achievement. It is explained that this format could be used to assess anything, even a place to go out to lunch. Students offer suggestions for what they think meeting a standard looks like. They are encouraged to be specific. For instance, if someone suggests "creative" as a word, one might ask, What does that look like? How can I judge that? Is it what I think of as creative, or what you think of as creative? At that point students recognize that they need to be very concrete or the judging won't be fair.

Three or four criteria are specified to determine Quality of Animation. Students usually identify neat or clean drawings as one of the criteria because the ability to see the drawing clearly is important for communication, especially if the drawing is simple. Smoothness of movement becomes another descriptor because students recognize that animation is movement and that the movement needs to flow. Skips and jumps interfere with the illusion of movement. They also name storyline as an important element, noting that the message being communicated needs to make sense to the viewer. Because they have

learned that camera shots convey messages and bring the viewer into the animation, most students also think that utilizing camera shots effectively is an important element.

Students don't identify drawing skills as one of the necessary ingredients for Quality of Animation because they are not emphasized in this project. Drawing skills are addressed in subsequent units. After establishing criteria for Quality of Product, students move to fleshing out the other two scoring dimensions: Group Interaction and Approach to Work.

From the selected standards, students have identified three scoring dimensions for Skill Development and Approach to Work and team problem-solving.

1. The Quality of the Animation

(Students want to know what they have achieved and how to improve.)

2. The Student's Approach to Work

(All group members must be productive participants.)

3. Respect for Others and Equipment

(Students have to be able to communicate and work well together.)

Day 5: Brainstorm a Story Line

Creating common ground and individual investment

Equipment/support materials

- Markers and scrap paper

Concepts

The storyline and the storyboard that develops from it are critical elements of a successful project. Without a storyboard groups cannot effectively make design decisions or solve problems as they arise. The storyboard also serves as a quick reference when the instructor troubleshoots and makes suggestions during the production phase.

Groups of up to three people are established and the first activity for the newly formed groups is to brainstorm possible story ideas. Rules for brainstorming are quickly reviewed, stressing that students let their ideas come out quickly without censoring anything or making judgments. Then they select two or three ideas that they would like to communicate in their animation and propose storylines for them. The purpose of the brainstorming is to develop enough ideas and interests so that the group can find common ground to eventually select one topic for their animation. Groups are required to find something that they would all like to do so that everyone is invested in the project. Brainstorming serves as a beginning exercise in group dynamics as well because students have to work together to come to a consensus.

Activity

- Developing a storyline

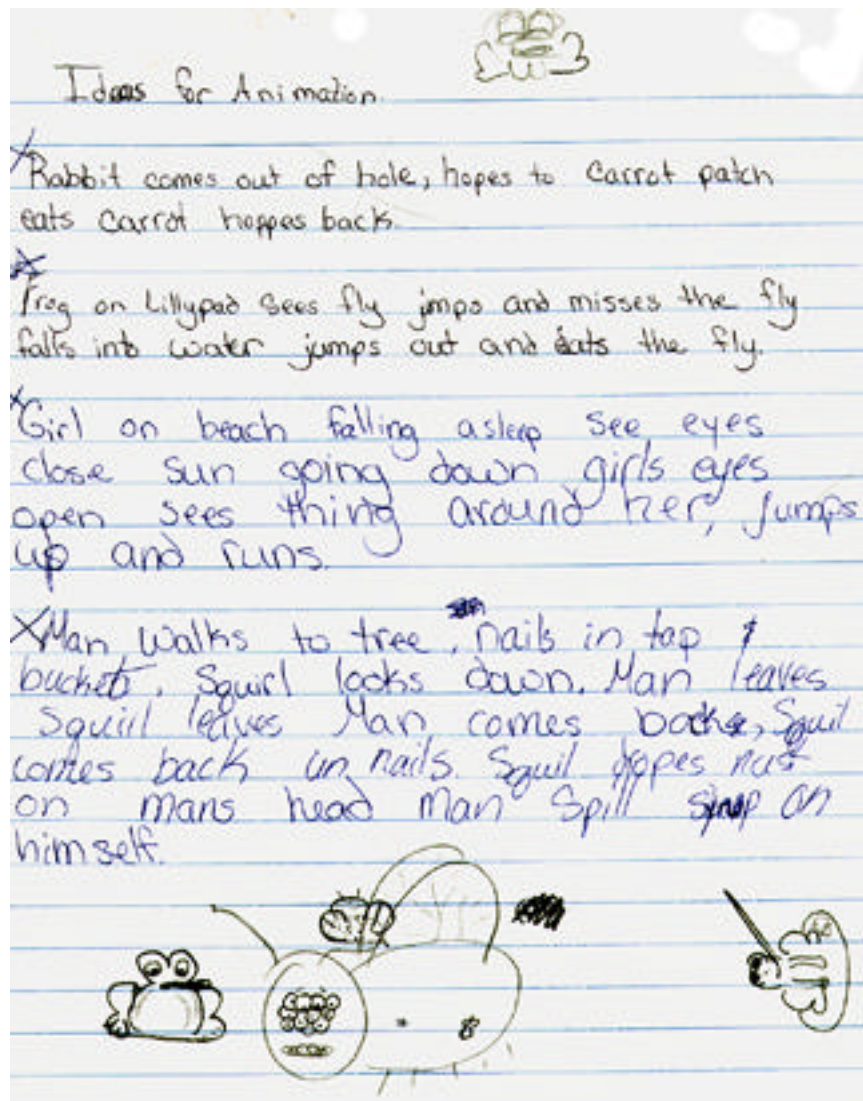
Students begin to brainstorm topics for their animation, remembering not to censor anything or make judgments.

From the brainstorming list, choose a topic all can agree upon and then develop a storyline. Allowing groups to choose their own subjects fosters investment in making the animations.

Analysis

- How can you combine ideas so that everyone is invested?
- What do you want to communicate?

Group brainstorming example



Days 6-7: Storyboards

Creating a planning tool

Equipment/support materials

- Examples of Storyboards
- Handout outlining what to include in a storyboard
- Large paper, markers and pencils
- Storyboard planning guide (Handout 4.a)

Concepts

The storyboard is invaluable as a planning tool. It provides a structure for group direction and it becomes vital to production as the animations evolve in complexity. The storyboard is a concrete plan that helps to unmask misconceptions and to build group communication. It also provides the instructor with a focus for facilitating during the production phase.

Analysis/discussion

- What information may be useful to have in your storyboards?
- Do you need to show every frame or every shot in your storyboard? (It's a good idea to review the difference between frames and shots.)
- Think about what you want to communicate and then try out different camera shots for effectiveness in getting your information across to the viewer

Activities

- Creating a storyboard

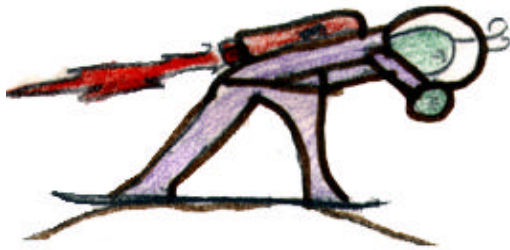
Required elements for the storyboard are identified. All storyboards must contain notations about what is moving, length of shot, and the specific camera shots and backgrounds to be used. Beyond these required elements, storyboarding is a process that provides the opportunity for each group to map out their unique ideas.

How students create a storyboard may vary. Some groups want to write a lot of words at first; others prefer images. They usually start out with a very rough copy. The job of

facilitator is especially important at this point in providing guidance to the groups as they think about different types of camera shots and different ways to tell their stories. Having a well thought out storyboard makes it easier to animate once students get to the computers.

Writing down the number of frames is helpful reference for students. Once they get caught up in the production process, students forget how many frames they will have to copy in order to get the amount of run time they desire for their animations. Even though students approximate what this number will be, (and it often changes,) having the estimate serves as a guide. It is also helpful to note that professionals estimate frames per shot during the initial stages of planning their animation.

Useful information to include-



**what is moving
estimated length of each shot
(x # frames per sec.)
the camera shots and
backgrounds to be used.**

As the storyboards are developed, assistance is offered to individual groups thinking about how their storyboard ideas will translate onto the computer. For instance, as they are planning for backgrounds, students usually notice that hundreds of frames will be needed to move their objects across the screen. Learning that the software has a "copy and paste" function, students appreciate how this greatly reduces redrawing time.

Throughout the animation unit, concepts are being introduced and reinforced in a way that is seamless for the students. Learning about camera shots, frames and movements becomes essential to the development of the storyboard. Once their storyboards are finished, students move to the computer to begin their animations.

Days 8: Learn Software Basics

Acquiring a basic tool set

Concepts/context

For many students, this may be their first experience with computer graphics. Therefore, it's important to make sure that some fundamentals are covered. Students need to learn how to create folders, save and retrieve files, and use the animation software at a simple level. This is the only day that the lesson is entirely instructor paced. The demonstration is prefaced with a question: "What do you think is necessary in order for the class to run smoothly?" Students usually identify that they need to stay with the group, that they not run ahead. Their instinct is to experiment immediately, yet on this single day it would be counterproductive for the class.

The goal for this day is to have students gain an overview understanding of the software. In the teacher demonstration, students see that the software uses frame stacks as a metaphor for pages in a flipbook and that the onion skinning feature (transparent tracing paper) is a tool that will ease production, like cut and paste. During the first 20 minutes, students are lead through the basic tools available from Metacreations Painter, and shown how to access those tools when they forget where the functions are located.

After the demonstration, students play with the program for 15-20 minutes so that they can practice what was shown. During this playtime, students check out different tools and find some of the brushes they might want to use later. By the end of the day, groups create a tiny animation of a simple shape that moves by going through frames. Even though this animation is only 6 or 7 frames, the initial movement is pretty exciting.

Day 9: Begin Production

Creating a climate which promotes problem solving and addresses different learning styles

Activities

- Students begin drawing their first frame on the computer.
- They interact with the software to determine which tools they want to use.

Making sure that students gain basic concepts and carefully plan their animations before entering a production phase is key to the success of the unit and gives both teacher and students a focal point for solving problems. In this way students create and refer back to their plans, revising as they go along. This process provides a structure for quickly fielding questions and gives the group a reference so they can respond in the moment to unpredictable production factors like: the computer's capability, software glitches, and other unanticipated problems that arise.

A climate is created where the questions and discussions focus on the storyboard and the message being conveyed rather than on teaching the full capability of the software. If there is confusion within the group about how something should be executed, students can be directed from across the room to look at the storyboard and see how different suggestions or ideas relate to goals. This puts the responsibility back onto the students, encouraging them to think about what they have to do. They make the decisions. The goal is to educate, not to train students to use a specific program. Programs change and are all written differently. Students need to be able to say, "I need this done," and then be able to find the appropriate function in the program. Students need the ability to articulate clear goals so that they can ask themselves questions that will lead to their own thinking about how to solve problems.

Behavior tips are given at this point that run counter to the previous training. For instance, when students sit in their groups at the computers, their backs are toward the instructor. Students are instructed to call across the room and ask for help. Often a

question can be answered quickly while the instructor is helping another group with a more complex question. Also, groups can hear the questions raised by each other and that decreases the repetition of the same question.

Progress is barely visible on the initial days of production because a lot of decisions are being made. After the first two days, the pace accelerates for the remaining production.

Days 10-11: Continue Production



Day 12: Critique and Reflection

Making tradeoffs between product completion and product quality

Day 12 is used to review the characteristics students defined for a "quality" animation. This refocuses the work because students realize then that there are only 3 or 4 days left. They begin considering issues such as: How can I maximize my product? They revise by cutting out shots or changing the execution plan. At this point there are discussions about quality but product completion enters into the conversation as well, as students make tradeoffs between quality and time.

Activity

- Animation reflection

Students fill out the Animation Reflection Worksheet. (6.a) It leads them through a series of questions focused on the quality of animation criteria established earlier. The Generic Rubric for Assessing Student Responses (1.b) is posted in the room in order to guide students in creating clear, articulate responses.

Days 13-14: Complete Production of Animation

Groups share their observations from the Animation Reflection worksheets. They continue to work on production while weighing the need to create a complete animation within the remaining time.

Day 15: Formal Assessment of Product

On the final day a formal sharing and assessment session is held. Students look at the animations and assess products and processes. They refer back to their student-generated rubric for guidance as they assess their work.

Rubrics with pre-defined criteria are used to assess: Approach to Work (2.b), Respect for Others and Equipment (3.b), and Quality of Animation (4.b).



Appendix A: Handouts and Worksheets

- 🎨 **1.a Camera Shots**
- 🎨 **2.a Cartoon Examples**
- 🎨 **3.a Common Camera-shots and Their Purposes**
- 🎨 **4.a Creating your Storyboard /Planning an Animation**
- 🎨 **5.a Animation Review**
- 🎨 **6.a Animation Reflection**

Appendix B: Rubrics

- 🎨 **1.b Generic Rubric for Assessing Student Responses**
- 🎨 **2.b Approach to Work**
- 🎨 **3.b Respect of Others**
- 🎨 **4.b Quality of Animation**

1.a Camera Shots

Names: _____

Different points of view and camera shots are techniques used in film, animation and video to emphasize emotion, capture viewers' attention and to communicate the storyline.

The accompanying cartoon shots include different camera shots and points of view. The artists use: LONG-SHOTS, MID-SHOTS, CLOSE-UPS AND EXTREME CLOSE-UPS to communicate their ideas.

Directions: under each point of view listed below, tape a corresponding example of it from the cutouts of cartoon shots.

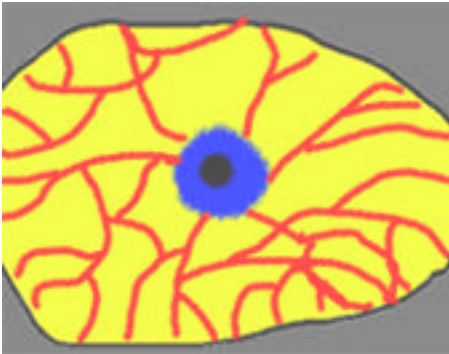
CLOSE-UP

LONG-SHOT

EXTREME CLOSE-UP

MID-SHOT

2a Cartoon examples of different camera-shots



3a Common camera-shots and their purposes

Mid-shot: A middle distance view of a scene.
(Effective in showing action.)

Close-up: A view taken at close range.
(Effective for showing facial expression, emotion and details.)

Extreme Close-up: An unusually close view of a particular object. (Useful for bringing attention to something not generally seen by a viewer.)

Long-shot: A distance view of a scene.
(Used to show the setting such as: time, weather, etc.)

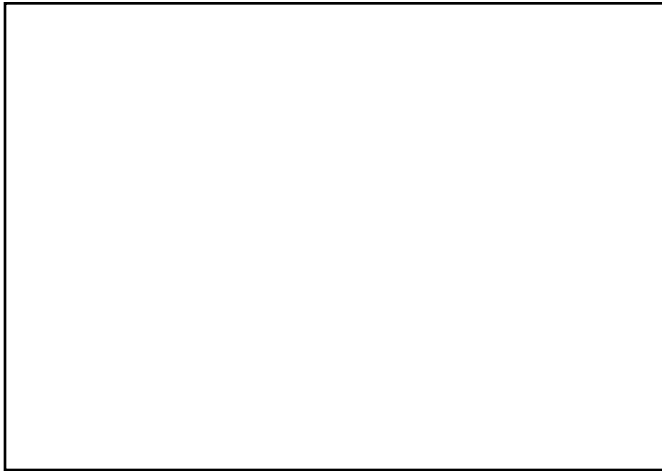
4a Storyboard planning sheet

Names_____

Title of Animation_____

Use this as guideline for planning out your animation.

sketch out scene 1 below



1. Describe the scene. What do you want to communicate? How will you depict this visually? What type of camera shot will help communicate the information?
2. Describe what will move.
3. Estimate how long this scene (camera-shot) will last in seconds)
4. Multiply #sec. by frame rate to estimate total #of frames needed in this shot. (5 per second works well with this program)

5a. Animation Review

Name: _____

Please answer the following questions.

1. Muybridge was a _____.
2. Explain how he studied movement using cameras.
3. Explain how frames in an animation create the illusion of motion.
(You may draw examples.)

4. What is generally included in a storyboard?

5. What is the purpose of a storyboard?

6. Filmmakers and animators use different camera distances and angles to enhance their movies. Each type of camera shot listed below is used to give specific information to the viewer. For each camera angle, please list at least two reasons an animator may choose that particular shot. **Close-up, Extreme Close-up, Mid-shot, Long-shot**

6a. Animation Reflection

Name: _____

Title of Animation: _____

Movement

Are there jumps in the movement? What are some of the strategies you used in order for your animation to run smoothly?

Storyline and camera shots

Describe your storyline. How do different camera shots in your animation work to communicate your story? Describe each shot in your animation and why it's effective in telling your story.

Clarity of drawings

What strategies have you used to create clear and neat drawings?

Problem-solving

How did your group solve a particular problem as you created your animation?

Rubrics/Assessment Tools and Accompanying Standards

1.b Generic Rubric for Assessing Student Response

- Level 3** Accurately describes the reference being discussed. Gives detailed examples, references, connections or responses to general insights. Uses vocabulary specific to film and animation.
- Level 2** Accurately describes the reference being discussed. Uses a mix of discipline specific vocabulary and general terms.
- Level 1** Gives general comments that could apply to other situations as well as the one under discussion.

Standards addressed:

Vital Results – Communication Expression/Artistic Dimensions 1.16

Students use a variety of forms, such as dance, music, theater, and visual arts, to create projects that are appropriate in terms of the following dimensions:

Reflection and Critique - Students improve upon products and performances through self-reflection and outside critique, using detailed comments that employ the technical vocabulary of the art form.

2.b Rubric for assessing student Approach to Work

- Level 3** Students are self-directed and focused on group generated goals
Students make decisions based on knowledge and skills
Students experiment and investigate a variety of ideas and approaches
Students refer to planning documents to solve problems
- Level 2** Students are usually self-directed and focused on group generated goals
Students usually make decisions based on knowledge and skills
Students experiment and investigate a few different ideas and approaches
Students usually refer to planning documents to solve problems
- Level 1** Students are infrequently on task and focused on group generated goals
Students sometimes contributes ideas
Students sometimes refer to planning documents to solve problems

Standards addressed:

Expression/Artistic Dimensions 1.16

Students use a variety of forms, such as dance, music, theater, and visual arts, to create projects that are appropriate in terms of the following dimensions:

Approach to Work

Students safely approach their media, solve technical problems as they arise, creatively generate ideas, and cooperate with ensemble members where applicable.

Problem Solving Process 2.2

Students use reasoning strategies, knowledge and common sense to solve complex problems related to all fields of knowledge.

3.b Rubric for assessing student Respect for Others and Equipment

- Level 3** Students are able to compromise, respect other's ideas and listen to other's ideas.
Students interact respectfully.
Students use equipment appropriately.
- Level 2** Students usually compromise, respect other's ideas and listen to other's ideas.
Students usually interact respectfully.
Students usually use equipment appropriately.
- Level 1** Students sometimes compromise, respect other's ideas and listen to other's ideas.
Students rarely interact respectfully.
Students rarely use equipment appropriately.

4.b Rubric for assessing Quality of Animation

Level 3	<p>Animation has smooth movement, no jumps</p> <p>Animation has a complete storyline or message.</p> <p>Animation uses different camera shots or perspectives to communicate effectively.</p> <p>Animation has clear and neat drawings. Shows effective use of tools and techniques.</p>
Level 2	<p>Animation has few skips in movement.</p> <p>Storyline or message is mostly understandable.</p> <p>Use of different camera shots or perspectives begin to enhance message or storyline.</p> <p>Drawings begin to become clearer and neater. Shows knowledge of tools for clarity and neatness.</p>
Level 1	<p>Animation movement is jumpy.</p> <p>Storyline or message is vague.</p> <p>Some use of different camera shots or perspectives.</p> <p>Basic drawings, shows some use of tools for clarity and neatness.</p>

Standards Addressed: Arts, Language and Literature Standards

Elements, Forms, and Techniques in the Arts

5.28 Artistic Proficiency

Students use art forms to communicate, showing the ability to define and solve artistic problems with insight, reason, and technical proficiency.

Literature and Media

5.15 Design and production

Students create media products, which successfully communicate.