Sherlock Gnomes
Engineering and Animation, 4th Grade
Teacher Guide

Objective

Students will be able to analyze the 5-step animation process to generate systems and tools to improve its efficiency.

Introduction

When creating an animated sequence, movie studios use a 5-step process that transforms an idea into a fully-realized animation. The Production Team consists of a group of artists working through each of the 5 steps: Storyboarding, Blocking, Animation, Pre-Lighting, and Final Lighting. This process can go on for 2-3 years when artists are working on a feature film. While each step happens sequentially, there may be times when the artists have to re-work scenes or develop new ones, which requires a return to the beginning steps of the process. Often, the Marketing Team will work with the Production Team to identify the first complete scene that can be used in a process called "Market Research," where the Marketing Team shows the scene to many people to determine the interest in the movie. Based on their feedback, the Marketing Team will work with the Production Team to revise parts of the movie.

Activity

This activity will lead students to exercise higher-order thinking skills by leading them through a series of scaffolded activities.

Remember: Distribute Worksheet 4-A and play "Animating Sherlock Gnomes" video for students, pausing where necessary. As each step is introduced, have students write in the name for each.

> *Formative Assessment*: Ask students to hold up fingers in response to questions you ask about the 5-step process. "How many steps are in the animation process?" "During what step do the artists start to add light?"

Understand: Direct students' attention to the middle section of the worksheet that details the days required for each step in the process.

Apply: Ask students the following questions and have them discuss their answers with peers. "What are the artists doing during the 8 days of blocking?" "Storyboarding takes the longest time. What about this step needs extra time?"

> *Math Connection*: Have students calculate the total cost of each step and answer the word problems below.
> CCSS.MATH.CONTENT.4.OA.A.2

Analyze: Read the prompt from the top of Worksheet 4-B aloud. Since making movies is a business, sticking to a budget and meeting deadlines is important to ensure that the movie makes money. However, choices may have negative effects on the ease of the process, employee satisfaction, or quality of the end product.

Have the students answer the questions in each circle about their thoughts and plan for making the animation process fit within the constraints.

Evaluate: Put students in groups and have them share their answers with each other. Have them identify their strongest ideas for cutting costs and time while minimizing negative effects.

Create: Ask the groups of students to create a plan that will fit the 5-step animation process within the listed constraints. Instruct the students to create a cost summary, a schedule, and a written rationale for why their system is most effective. If you wish, you can have the students present their ideas to the class.

> *Summative Assessment*: Evaluate student work to determine if they exceed, meet, or approach standards. Implement the suggestions to group students and expand the lesson, if you wish.

Exceeds Standards:	Plan meets time and budget requirements and includes creative solutions to minimize negative effects their plan may cause.
	Have students create a plan for transitions between each step and include them in the schedule.
Meets Standards:	Plan meets time and budget requirements but does not adequately address negative effects their plan may cause.
	Provide students with feedback on their plan and the negative effects it may cause. Have students revise their plan to address these effects.
Approaching Standards:	Plan does not meet time and/or budget requirements.
	Tell students that their school day will be reduced to 3 hours. Have them create a list of negative consequences of this decision.

Duration   1 hour

Standards   Next Generation Science Standards
                    3-5 ETS1-1

                    National Core Arts Standards
                    MA:Cr.2.1.4

Differentiation　Advanced students can be asked to create several plans that can be presented to their boss. Have the students create back-up plans should something go wrong (steps take longer than expected, the movie goes over budget, etc.).

Beginning students can be given extra days in their schedule and more money to reduce the amount of adjustments that need to be made to their plan.

Vocabulary

Tier 2	Tier 3
Animate	Production Team
Process	Marketing Team
	Market Research

Sherlock Gnomes

Name _____

Engineering and Animation, Worksheet 4-A

Write the five steps of the animation process.

step 1 _____

step 2 _____

step 3 _____

step 4 _____

step 5 _____

The prices below indicate how much each day costs. Calculate the total cost of each step.

step 1	$12	8 days	$ _____
step 2	$18	6 days	$ _____
step 3	$24	6 days	$ _____
step 4	$12	2 days	$ _____
step 5	$6	2 days	$ _____

Two storyboarders split the money from step 1. How much do they each get paid?

The work from step 3 was lost so it had to be done again by Jazmine, the only animator on staff. How much money did she make all together?

Robert worked on blocking alone for 2 days and Mariah worked alone on the other days. How much money should Robert be paid?

_____each

_____

_____

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Engineering and Animation, Worksheet 4-B

You have just been promoted to Director of Production for *Sherlock Gnomes*. You have been given a budget of $300 and a deadline of 20 days to complete the movie.

Create a plan that would complete the movie on-time and on-budget (you will need to make some sacrifices!). Answer the questions below and discuss your answers with a friend. Work together to create a plan that will give you the best movie while still meeting the deadline and the budget.

How will I cut costs?

How can I finish all the steps in 20 days?

What effect does cutting costs have on the movie?

What effect does this deadline have on the movie?