MAKER LESSON PLANNING GUIDE

Name of lesson: Mitosis Stop Motion		**Duration:** five 90 min blocks
Subject/Course: Biology	**Teacher(s):** S. Jean Feeser	**Grade Level:** 9
Interdisciplinary connections: Art, Writing, Video & Film Production		

Key Knowledge and Understanding (content standards)	6A) explain the importance of the cell cycle to the growth of organisms, including an overview of the stages of the cell cycle and deoxyribonucleic acid (DNA) replication models	
Lesson Summary How will the lesson be introduced? What are students being asked to make, build, or invent? How does it connect to their lives/community?	In this project, students work in groups to create a stop motion video that illustrates the phases of the cell cycle for a eukaryotic cell. Stop motion is an animation technique in which objects are physically manipulated in small increments to give the impression of movement. Students study the phases of the cell cycle. Using various materials, students will construct a model of each stage, labelling important events and cell structures that are observed. Students will reflect on the importance of these events and structures, as well as the role of cell division in living things.	
Elements of Making (to be taught and assessed; describe how the lesson addresses each element)	**Makers create a personally meaningful product** Students will create a product using craft materials and video editing. They have can personalize their products with the type of materials, software, and design of the animation.	**Makers engage in iterative design & fabrication** Students first create a storyboard to plan their animation, identifying the scenes and materials needed. They will use constructive feedback from their peers and teacher to make revisions.
	Makers demonstrate a Maker mindset Students learn new skills and technology, collaborate with others, and revise their work based on feedback.	**Makers collaborate and connect with community** Students work in groups to complete the project, reflect on their contributions, and provide feedback for others.
	Makers present work publicly Students will present their work to their peers and receive constructive feedback to improve their product.	**Makers utilize content specific knowledge and skills** Students use scientific vocabulary in their video and written responses. They apply their understanding of cell structure and the cell cycle when creating the storyboard, animation, and answering questions.
Assessment & Presentation of Work	Individual and/or team products to be created: Each group will create a detailed storyboard, stop motion animation video, and written responses to questions. Individual contributions will be evaluated using the self and peer evaluations.	

	Specific content and skills to be assessed: Students will be assessed on their correct use of scientific vocabulary and accuracy of their videos and written communication about the cell cycle.
	How will the products be made public and who will students engage with? Each group will present their videos to their peers, with an opportunity to upload their final products to an online platform (such as BLEND)

MAKER LESSON RESOURCES

Resources Needed	Facilities: Computer lab
	Equipment/Materials/Safety: Video editing software (such as iMovie or Windows Movie Maker), animation stand, camera, arts and crafts materials
	People/Community Resources: Stop Motion Animation Handouts*: Planning Sheet, Grading Rubric, Procedure & Analysis, Self & Peer Evaluation*

MAKER LESSON SEQUENCE

Estimated Time	**Description of Lesson Segment** **Include a description of what the teacher does and what the students do in each segment*	**Checkpoints/ Formative Assessment Questions/ Opportunities for Reflection**	**Specific resources and skills needed for this segment.** **Include safety considerations*
1 Day	Introduction, Team Planning Day Students review project outline and rubric, form groups and define roles, complete *Planning Sheet* (including storyboard/script). Teacher introduces project, reviews timeline and rubric, facilitates structured planning time.	Completed *Planning Sheet*, CFS: - Detailed drawings for each phase - Labels of cell parts - List of materials needed The teacher should check student understanding of the project expectations, asking questions related to the rubric such as: - What grades will be taken? - How will the final product be graded? - What materials will you need? - How many pictures will you take? Teacher should check each group's *Planning Sheet* for completeness and make suggestions for materials as needed.	*Planning Sheet, Grading Rubric*

2 Days	<u>Setup, Stop Motion</u> Students record stop motion animation. Teacher checks that groups are following the rubric and guidelines, provides technology support.	Teacher should check that groups are using the *Planning Sheet*, representing cell structures accurately, and including labels.	*Planning Sheet, Procedure & Analysis, Grading Rubric* Animation stand, camera, arts and crafts materials
1 Day	<u>Video Editing</u> Students upload pictures to computers, create, and edit animation video. If video is not good quality and transitions are not fluid, students can retake photos. Teacher checks that groups are following the rubric and guidelines, provides technology support.	Completed *Procedure & Analysis*, CFS: - Answers all questions in complete sentences Teacher should check that students are evaluating their product using the *Grading Rubric* and make suggestions on areas of improvement.	*Procedure & Analysis, Grading Rubric* Video editing software
1 Day	<u>Presentations, Group Evaluations</u> Students present projects, complete self and peer evaluations. Teacher grades projects, facilitates and reviews group evaluations.	Completed *Self & Peer Evaluations*, CFS: - Answers all questions in complete sentences - Includes constructive feedback for group members Students should provide constructive and specific feedback to their peers as they present their videos. Teacher should check that students are reflecting on their contributions using the *Self & Peer Evaluations*.	*Self & Peer Evaluations, Grading Rubric*