



STEM Centric Planning Guide



Title: Hybrid Animals	Teacher: Cassie Mallow and National Park Service Rangers
Overview: Use this lesson as a post-C&O Canal field trip visit or as a stand-alone classroom activity. There are three activities: 3-D modeling (students will create a hybrid animal using their design activity sheet from their park visit and play dough), opinion writing (students write opinion piece explaining the design of their animal hybrid), and flipbook (students create a flip book of hybrid animals that they design).	Grade: 1st
STEM Standards of Practices: Engage in <u>meaningful, purposeful and relevant</u> STEM activities using the Stem Standards of Practice Frameworks; student skills and knowledge indicators, instructional examples, resources and glossary.	
<p><i>STEM proficient students will be able to apply all seven Standards of Practice when demonstrating how to answer complex questions, to investigate global issues, and to develop solutions for challenges and real world problems.</i></p>	
<div data-bbox="175 842 781 1251" data-label="Diagram"> <p style="text-align: center;">STEM Standards of Practice</p> <ul style="list-style-type: none"> ■ STEM Content ■ Integrate STEM ■ Communicate STEM ■ Inquiry STEM ■ Logical Reasoning STEM ■ Collaboration STEM ■ Technology STEM </div>	<p>Real World Problem:</p> <p>A hybrid animal is one that is an offspring of two animals or plants of different races, breeds, varieties, species, or genera. Mules are a hybrid animal, bred to have special qualities that benefit man. That makes them uniquely qualified to do their job of pulling canal boats. They are stronger than horses, live longer, are less prone to illness and injury, and more sure-footed. The students will use design hybrid animals and describe their unique features.</p>
<p>Product/Prototype/Model</p> <p>Students will design a hybrid animal in 3-D, write an opinion piece about their design, and make a flip book showing several hybrid animals.</p>	

Content Standards



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Science	Technology	Engineering Design Process	CCSS Mathematics/Practices	CCSS ELA	Social Studies	Fine Arts
Transdisciplinary Connections:				Enduring Understanding:		
Connection to STEM Careers:				Essential Questions:		

Lesson Procedures: 5E Components	Suggested Activities	STEM Standards of Practice
<p>* The 5E model is cyclical, not linear and components may be repeated or revisited over the course of the lesson. A 5 E model lesson may last longer than 1 period or block of time.</p> <p>* Evaluation of student’s learning occurs throughout the 5 E model. Evaluations may include student self-evaluation, peer group evaluation, and/or teacher monitoring student’s progress.</p>		
<p>Engagements (Repeated process) Did you design an activity that...</p> <ul style="list-style-type: none"> <input type="checkbox"/> captures students’ attention? <input type="checkbox"/> activates students’ prior knowledge? <input type="checkbox"/> connects to a complex question, global issue, or real world problem? 		<ul style="list-style-type: none"> <input type="checkbox"/> STEM Content <input type="checkbox"/> Integrate STEM <input type="checkbox"/> Communicate STEM <input type="checkbox"/> Inquiry STEM <input type="checkbox"/> Logical Reasoning STEM <input type="checkbox"/> Collaboration STEM <input type="checkbox"/> Technology STEM
<p>Explorations Did you design an activity that allows students to...?</p> <ul style="list-style-type: none"> <input type="checkbox"/> analyze the science, technology, engineering, mathematics, and other disciplines as appropriate in a complex question, global issue, or real world problem? <input type="checkbox"/> apply the engineering design process, scientific investigation, and/or mathematical practices? <input type="checkbox"/> select and employ technological tools that are relevant to answering a complex question, investigating a global issue, or developing solutions to a real world problem? 		<ul style="list-style-type: none"> <input type="checkbox"/> STEM Content <input type="checkbox"/> Integrate STEM <input type="checkbox"/> Communicate STEM <input type="checkbox"/> Inquiry STEM <input type="checkbox"/> Logical Reasoning STEM <input type="checkbox"/> Collaboration STEM <input type="checkbox"/> Technology STEM



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Explanations Did you design an activity that allows students to...? <input type="checkbox"/> analyze information, data and draw conclusions? <input type="checkbox"/> communicate understandings and possible solutions?		<input type="checkbox"/> STEM Content <input type="checkbox"/> Integrate STEM <input type="checkbox"/> Communicate STEM <input type="checkbox"/> Inquiry STEM <input type="checkbox"/> Logical Reasoning STEM <input type="checkbox"/> Collaboration STEM <input type="checkbox"/> Technology STEM
Extensions / Elaborations Did you design an activity that allows students to...? <input type="checkbox"/> modify experimental procedures, prototypes, models, or solutions? <input type="checkbox"/> analyze STEM careers that relate to the learning activity?		<input type="checkbox"/> STEM Content <input type="checkbox"/> Integrate STEM <input type="checkbox"/> Communicate STEM <input type="checkbox"/> Inquiry STEM <input type="checkbox"/> Logical Reasoning STEM <input type="checkbox"/> Collaboration STEM <input type="checkbox"/> Technology STEM
Evaluations Did you design an activity that allows students to...? <input type="checkbox"/> demonstrate understanding of concepts through rubric-based performance assessments? <input type="checkbox"/> participate in peer reviews?		<input type="checkbox"/> STEM Content <input type="checkbox"/> Integrate STEM <input type="checkbox"/> Communicate STEM <input type="checkbox"/> Inquiry STEM <input type="checkbox"/> Logical Reasoning STEM <input type="checkbox"/> Collaboration STEM <input type="checkbox"/> Technology STEM