3rd-6th STEM Activity Library

PEARL HARBOR AVIATION MUSEUM

Please choose one of the STEM Activity listed below as part of your Virtual Classroom Visit. Next Generation Science Standards and Hawaii DOE Common Core Standards are listed with each STEM Activity.

Forces and Principles of Flight

Students will learn how a million pounds of aircraft manages to get and stay airborne. Includes a brief overview of Bernoulli's Principle in relation to the four forces of flight and two mini experiments to illustrate.

Bomb Drop

Based on the Battle of Midway, students will use a coordinate plane (x,y) to guide an SBD Dauntless dive bomber toward its targets on the Japanese aircraft carrier Kaga. This activity requires the accompanying worksheet.

Distance to Tokyo

The Doolittle Raid of 1942 relied on precise planning and mathematical skill. Students will calculate the mileage needed to carry out this stealth bombing mission, and return to safety. This activity uses an accompanying worksheet.

Gear Prep

Students will modify a B-25 Mitchell Bomber through a series of engineering decisions. Their choices will affect the outcome of a hypothetical storyline, in real-time, based on the actual events of the Joint Army-Navy Bombing Project (aka Doolittle Raid).

NGSS AND HAWAII DOE COMMON CORE STANDARDS

Forces and Principles of Flight

NGSS.3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

NGSS.3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

NGSS.5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.

Bomb Drop

CCSS.MATH.CONTENT.4.MD.C.5
Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

CCSS.MATH.CONTENT.4.MD.C.5.A
An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.

CCSS.MATH.CONTENT.4.MD.C.6
Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

CCSS.MATH.CONTENT.4.G.A.1
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

CCSS.MATH.CONTENT.5.G.A.1
Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).

CCSS.MATH.CONTENT.5.G.A.2
Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

CSSS.WH.6.17.3

Analyze the turning points in the Pacific and European theatres of combat during WWII

Distance to Tokyo

CCSS.MATH.CONTENT.3.NBT.A.2
Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCSS.MATH.CONTENT.4.NBT.B.4
Fluently add and subtract multi-digit whole numbers using the standard algorithm.

CSSS.WH.6.17.3

Analyze the turning points in the Pacific and European theatres of combat during WWII

Gear Prep

CSSS.WH.6.17.3

Analyze the turning points in the Pacific and European theatres of combat during WWII

CCSS.ELA-LITERACY.RI.3.3
Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

CCSS.ELA-LITERACY.RI.4.3
Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.

CCSS.ELA-LITERACY.RI.5.3
Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

CCSS.ELA-LITERACY.SL.3.1
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.3.1.B
Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).

CCSS.ELA-LITERACY.SL.3.1.D
Explain their own ideas and understanding in light of the discussion.

CCSS.ELA-LITERACY.SL.4.1
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.4.1.B
Follow agreed-upon rules for discussions and carry out assigned roles.

CCSS.ELA-LITERACY.SL.4.1.D
Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

CCSS.ELA-LITERACY.SL.5.1
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.5.1.B
Follow agreed-upon rules for discussions and carry out assigned roles.

CCSS.ELA-LITERACY.SL.5.1.D
Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.