OVERVIEW

Students explore the four forces of flight, the properties of air, and the design process. Through two team challenges, they will design, test, collect data, and evaluate different aircraft prototypes.

BIG IDEAS

- Four forces of flight
- Properties of air
- Design constraints, variables, and evaluation

OUTCOMES – What will the students know or be able to do at the end of the lesson?

- Design an aircraft to perform specific tasks, test prototypes, collect data, and evaluate a design
- Identify the four forces of flight and how they can be balanced and unbalanced to control aircraft flight

VOCABULARY

<table>
<thead>
<tr>
<th>Air</th>
<th>Drag</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>Gravity</td>
<td>Constant</td>
</tr>
<tr>
<td>Lift</td>
<td>Thrust</td>
<td>Evidence</td>
</tr>
</tbody>
</table>

EXTENDED LEARNING

In your classroom:
- Smithsonian How Things Fly: explore how air moves
- Smithsonian How Things Fly: explore how wings work
- Smithsonian How Things Fly: explore the properties of air

At the Museum:
- Helicopters: The Tower in the Great Gallery: learn about the mechanics of flight
- The Red Barn: learn about early aviation and aircraft design

RESERVATIONS

For reservations, please call 206-764-1384 or email: educationreservations@museumofflight.org.
For grant assistance, please visit www.museumofflight.org/education/grant-assistance.
Next Generation Science Standards (NGSS)

- 3-5 Engineering Design: 3-5-ETS1-2, 3-5-ETS1-3
- Forces and Interactions: 3-PS2-1
- Space Systems: Stars and the Solar System: 5-PS2-1

Common Core State Standards (CCSS)

- ELA: Speaking & Listening: CCSS.ELA-Literacy.SL.4.1, CCSS.ELA-Literacy.SL.4.1(b-d), CCSS.ELA-Literacy.SL.5.1,
  CCSS.ELA-Literacy.SL.5.1(b-d)
- ELA: Reading Foundational Skills: CCSS.ELA-Literacy.RF.4.4, CCSS.ELA-Literacy.RF.4.4.a, CCSS.ELA-Literacy.RF.5.4,
  CCSS.ELA-Literacy.RF.5.4.a
- ELA: Reading Informational Texts: CCSS.ELA-Literacy.RI.4.4, CCSS.ELA-Literacy.RI.5.4
  CCSS.ELA-Literacy.L.4.4, CCSS.ELA-Literacy.L.4.4(a,c), CCSS.ELA-Literacy.L.4.6, CCSS.ELA-Literacy.L.5.1, CCSS.ELA-
  Literacy.L.5.2, CCSS.ELA-Literacy.L.5.3, CCSS.ELA-Literacy.L.5.4
  Literacy.W.5.2.d

21st Century Skills

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration
- Flexibility and Adaptability
- Initiative and Self-Direction
- Social and Cross-Cultural Skills
- Productivity and Accountability
- Leadership and Responsibility