Surface Area of an Airplane Wing for 6th Grade

Jennifer Peters

ENGAGE

- Students will consider the elements of flight, including forces of thrust/drag and lift/weight and generate predictions and questions relevant to the topic
- Students will engage with interactives from the Smithsonian Air and Space Museum to ignite interest

EXPLAIN & EVALUATE

- Students will test the different wing designs using 3D models of cardstock
- Students will record quantitative and qualitative observations based on wing surface area and draw conclusions about the relationship between surface area of a wing and flight

Guiding Question:
How does the surface area of the wing of a plane affect flight?

EXPLORE

- Students will be divided into groups and provided with the measurements of 5 different common plane wing dimensions
- Students will assign team members to record the solutions to the calculations with explanation and evidence for how they solved for surface area

ELABORATE & EXTEND

- Students will analyze the data collected from the investigation to determine a prototype for a new wing design
- Students will calculate the surface area represented and test their hypothesis

5 E's with Representational Fluency Through Modeling

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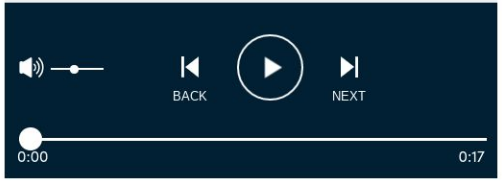
plane is called a DC-3. But you won't really see what it looks like until you put the pieces of the airplane together. Can you drag and drop the pieces of this airplane puzzle into place? When you have put the airplane back together, click the next button.



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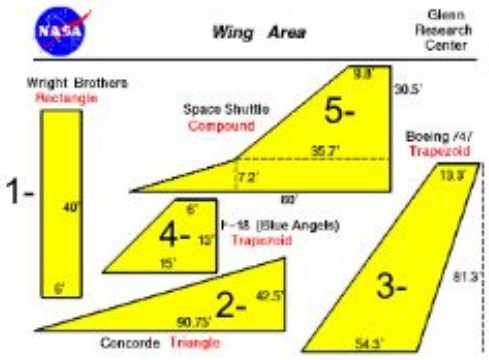
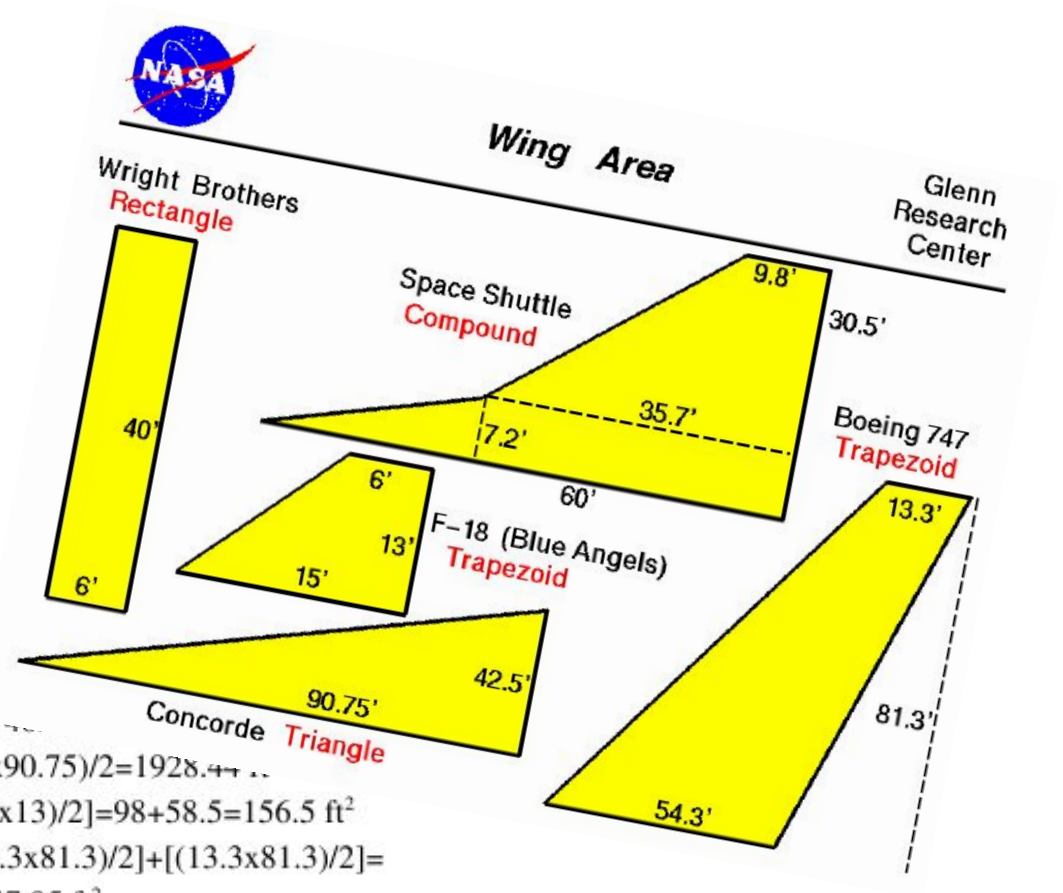




ANSWERS:

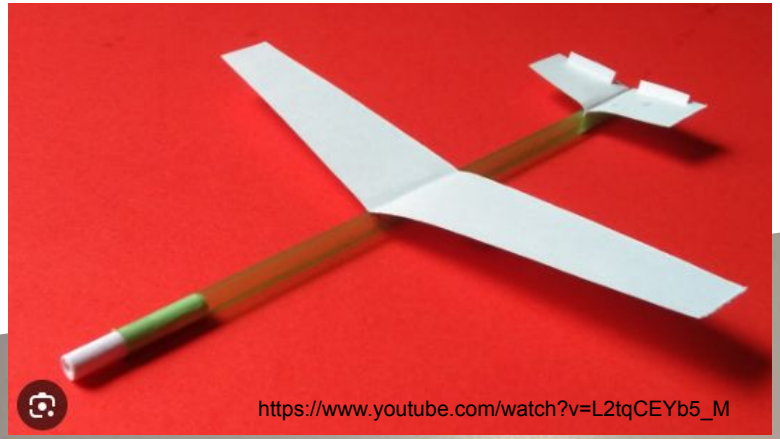
1) Wright Borthers. [illegible]

2) Concorde: (42.5x90.75)/2=1928.44 [illegible]

3) F-18: (6x13)+[(9x13)/2]=98+58.5=156.5 ft^2

4) Boeing 747: [(54.3x81.3)/2]+[(13.3x81.3)/2]=
2207.3+540.65=2747.95 ft^2

5) Space Shuttle:
(35.7x7.2)+(23.3x9.8)+[(24.3x7.2)/2]+[(23.3x25.9)/2]=
257.04+228.34+87.48+301.74=874.6 ft^2



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