Unit Review
air aerodynamics and flight

SLEs	Activities
• **Properties of Air** ○ has pressure ○ has mass ○ composition of air Recipe for air Login to Learn Alberta site Click on Grade 6 Click on science Click on The Thrill of Flight Topic 2 – What is Air?, Lesson 1 ▪ nitrogen oxygen, carbon dioxide ○ takes up space ○ can be compressed ○ has no fixed shape ○ hot air expands/rises	• Automatic Water Fountain • Weighing Balloons (Edmonton Public Science – Topic A – page 11) • Water in Jar with Candle (make note that it does not completely fill with water because the nitrogen in the air is taking up space too – discuss properties of carbon dioxide, oxygen, nitrogen – ex: mass) • Fruit Oxydation Learn Alberta site – Topic 2, Lesson 1 • A Bizarre Jar (Explorations in Science "It's in the Air, page 15), Balloon in a Bottle • Syringe (Edmonton Public – Topic A – page 20) • A Bizarre Jar (Explorations in Science "It's in the Air, page 15) • Balloon on bottle changing temp (Edmonton Public – Topic A – page 27; use a 2L bottle, near boiling water, ice water - mostly ice) • Compare the properties of air with real life situations (bicycle pump, aerosol can, inflated balls, tires, balloons, elevation, barometric pressure)
• **How Things Fly** ○ Bernoulli's Principle Learn Alberta site – Topic 2, Lesson 2 ○ The 4 Forces	• Airfoils, ping pong ball, blowing across strip of paper

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Learn Alberta site – Topic 2, Lesson 2 & 3; Topic 3, Lesson 1 ▪ thrust, drag, lift, gravity (weight) ○ Adaptations of animals Bird Technology – diagram, mini-cam of flight ▪ The 4 Forces ▪ Control surfaces ▪ Streamlining ▪ Propulsion Learn Alberta site Topic 3, Lesson 4	• Diagrams of various things shown from different angles (birds, animals, balloons, helicopters, riding a bike etc) Learn Alberta Site – Label parts of plane, helicopter • Diagrams of birds and insects Click on Insects and/or Gliding, Flapping, Soaring links on left hands side • Cutting Through the Air (Edmonton Public – Topic A – page 68, adapt as needed) – discuss variables in changing the angle of ramp, shape of paper etc • Balloon Rockets, Alka-Seltzer Rockets (Alka-Seltzer Rockets can also be used in water)
• **Controlling Flight** ○ Parts of the plane Learn Alberta site Topic 3, Lesson 2,3; glider, helicopter Learn Alberta site Topic 4, Lesson 1, 2 ○ What controls the parts – levers, pedals ○ Aerodynamics Informative, interactive and comprehensive website – scroll down to Airplane Parts and choose activity	• Interpret and answer questions based on the chart • Diagrams of various flying objects to label parts and the controls for those parts (planes, helicopters, gliders, birds, blimp, parachutes, etc) Parts for plane - printable,

Experiments that Demonstrate Properties of Air

Match the property of air to the experiment.

1) Air exerts pressure _____
2) Air has mass (weight) _____

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3) Air takes up space _____
4) Air can be compressed _____
5) Air is made up of nitrogen, oxygen, carbon dioxide _____
6) Hot air expands and rises _____

Answer Key

a) Why Does the Water Rise
b) Automatic Water Fountain
c) A Bizarre Jar/Balloon in a Bottle
d) A-Weigh We Go
e) Taking the Plunge
f) Balloon in a Bottle

Which property of air do the following situations show?

Bicycle pump _____

Elevation _____

Aerosol can _____

Balloon _____

Inflated balls _____

Barometric pressure _____

Tires _____

Identified Flying Objects	**What gives it lift**	**What gives it thrust**	**What controls direction of travel while in the air**
Airplane	Elevators down	Engine	Rudder Ailerons
Glider	Elevators down	Tow Plane Air current	Rudder Ailerons
Helicopter	Head Rotor	Tail Rotor Engine	Tail Rotor also acts as a rudder

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Blimp	Propellers	Engine	Rudder Elevators
Hot Air Balloon	Hot air (heated by flame)	Air current	Air current Opening and closing top flap
Spacecraft	Rocket fuel ejected during launch	Rocket engines	Releasing jets of air to change direction
Parachute	Air resistance	None	Shroud lines
Flying Birds	Wings Hollow bones	Wings	Tail Wing tips
Flying Squirrels	None	None	None
Flying Insects	Wings	Wings	Wings
Projectiles	Another object	Another object	Air current

Use the chart above to answer the following questions.

What would be an appropriate title for this chart?

_____

Which object uses a head rotor to gain lift and a tail rotor to change direction?

_____

Which objects use wings for propulsion?

_____

How is the tail of a bird like the rudder of a glider?

_____

How are ailerons on an airplane similar to the wing tips of a bird?

_____

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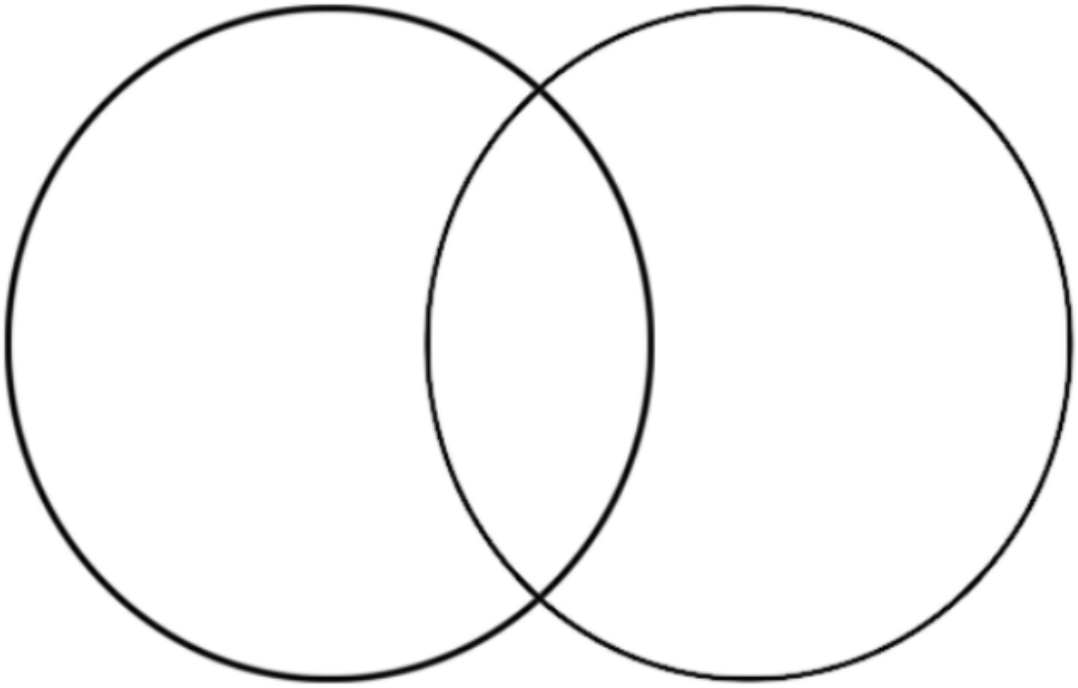
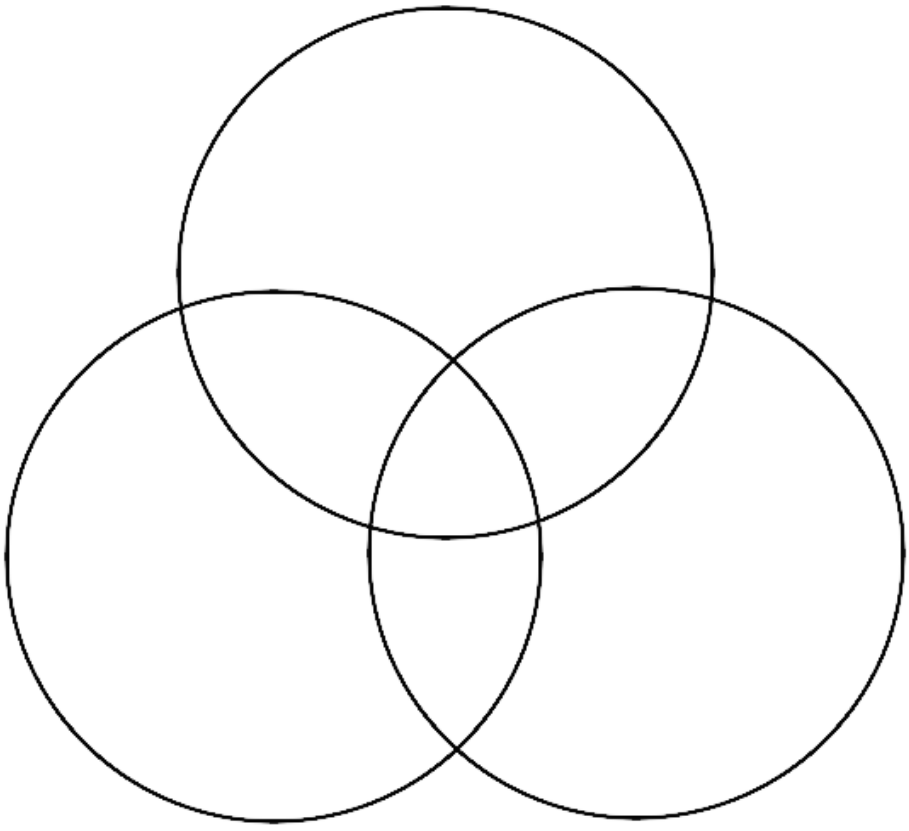
Use the chart to make a Venn diagram comparing 2 or 3 objects.





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