**North East School Division Planning Organizer**



**Science Grades 6 - 9**

|  |
| --- |
| **Stage 1 – Begin With the End in Mind** |
| **Big Ideas** What do we want students to remember 40 years from now? |
| **How is flight achieved?** |
| **Outcomes** (Circle the verbs or skills, underline the qualifiers |
| **FL6.1 – Examine** connections between human fascination with flight and technologies and careers based on the scientific principles of flight.**FL6.2 – Investigate** how the forces of flight of thrust, drag lift and gravity act on living things and constructed devices that fly through the air.**FL6.3 – Design** a working prototype of a flying object that meets specific performance criteria. |
| **Understandings** What do we hope students will come to understand as a result of learning? Think: Students will understand that… | **Essential Questions** Questions for deeper understanding that invite deep thinking about the ideas and issues throughout the unit. |
| 1. Common characteristics of flight in our natural world.
2. People have been inspired throughout history by objects or things around them. Through testing many failures led to successes.
3. Canadian and Saskatchewan people have been instrumental in the development of aviation.
4. The similarities that exist between living things that fly and the technologies that engineers have designed.
5. Common forces that act on ALL things that fly or glide through the air.
6. First nations and Métis people have used their understanding of flight in order to survive in the natural world.
7. They have a part to play in being the next inventors or creators in testing devices.
8. The forces of flight are in action continually on all things.
 | 1. What did inspiration and design play in the development of flying devices?
2. What technological problems had to be overcome to develop a device that flies?
3. Who has contributed to new scientific developments in flight?
4. Where do we see principles of flight used by First Nations and Métis historically and still today?
5. What are the properties of fluids?
6. How do the forces of fluids act on objects on earth?
7. How is lift created?
8. How can modifications alter lift? Drag?
9. How have First Nations and Métis people shown understanding of flight in their weapon designs and stories?
10. How has flight technologies changed over the years?
11. How has flight technology changed our lives?
12. How can forces of thrust be created?
13. How can I create a flying prototype that meets specific criteria?
 |
| **Students need to know:** What is essential knowledge for students to have in order to demonstrate their understanding of the outcomes?  | **And be able to do:** What should they eventually be able to do as a result of their learning experiences in order to achieve the outcome? Should reference the indicators. Think: verb.  |
|  * Thrust, drag, lift and gravity
* Balanced and unbalanced forces
* History of flight around the world.
* Examples of traditional and modern flight technologies developed by first nations and Métis people
* History of flight in Saskatchewan
* How to create a scale-sized model
* How to manipulate materials to create a flying prototype
* What are appropriate materials
* Testing variables and making alterations
* Data collection
* Principles of air pressure (high and low)
* Aerodynamics principles (Coanada Effect, Bernoulli’s Principle, Payload)
* How to create a technical report
* High and low pressure
 |  1. Make observations of flying organisms and what enables them to fly.
2. Test models to explore thrust, drag, lift and gravity.
3. Explore modifications and their effect on flying devices. (wing shape and design)
4. Create questions as to what effect alterations will have on a flying device.
5. Research a historical technological flight achievement.
6. Diagram how forces of thrust, lift, gravity and drag act on living things.
7. Compare sources of thrust.
8. Create a working prototype, test and make appropriate alterations to meet specific criteria.
9. Demonstrate and explain prototype design and variables used.
10. Propose questions for futuristic flying devices.
 |