junior tech challenge

The practical side of science and tech

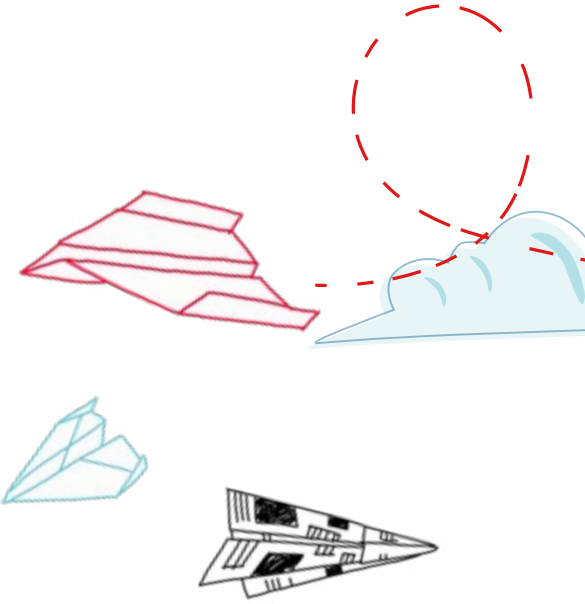
TAKE OFF!

2023-2024 EDITION

TEACHER'S GUIDE

Intended for:

Intensive ESL Project, Elementary Cycle 3
Science and Technology Program, Elementary Cycle 2 & 3



A program of

RÉSEAU TECHNOSCIENCE
Together for a new scientific generation

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INTRODUCTION

THE JUNIOR TECH CHALLENGE: A UNIQUE LEARNING SITUATION!

Every year in Quebec, the Junior Tech Challenge allows all elementary school students to learn about science and technology in a creative and fun way. The Junior Tech Challenge is an original, hands-on classroom project that is also a learning and evaluation situation (LES), aligned with the Progression of Learning and the Framework for the Evaluation of Learning for Elementary Science and Technology.

Six challenges are presented cyclically, one per year. Educational tools are offered to meet the challenge of the current year. The pedagogical content can be adapted according to the intended pedagogical objectives. With each new edition, the rules and educational tools are improved upon to ensure that they best meet teachers' needs.

This document is intended to support professionals who teach the Intensive ESL Project or the Science and Technology Program (*Elementary*), or anyone who wishes to experience the Junior Tech Challenge with their students in English.

THE RETURN OF, TAKE OFF!

Launching into its fifth edition, Take Off! returns to Quebec classrooms, featuring exciting challenges in distance, precision, and manoeuvring! All teaching tools are available free on our **technoscience.ca** website. To discover optimal strategies for using these tools effectively, we encourage you to view the informative capsule available on the web page (*in French only*).

FOR INTENSIVE ESL TEACHERS

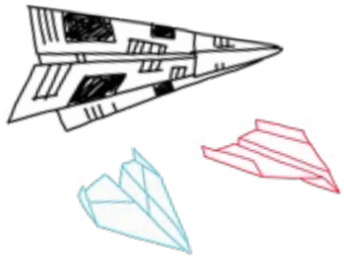
The students will have the opportunity to:

1. **Develop Competency 1 (*Interact orally in English*) through challenging hands-on activities.**
   The teacher will have various opportunities to observe the students' oral interactions during these activities*.

2. **Review and consolidate science knowledge in an English-language context.**
   The Science, Technology concepts covered in this LES have already been taught in previous cycles. This LES gives students the opportunity to put these concepts into practical application and reach their end-of-cycle objectives (*see Progression of Learning for Science and Technology on pages 6-7.*)

3. **Participate in an authentic learning situation.**
   The Junior Tech Challenge can be organized as a class competition, extended to a school-wide level, or elevated to a regional event. The latter provides students from selected schools the opportunity to connect with their peers from other schools participating in these Regional Finals.

** Optional resources such as evaluation tools, activity suggestions, and graphic organizers tailored for Intensive ESL learners can be found in Appendix 2, ESL Extras*



TEACHING TOOLS AVAILABLE

All documents, including those that have been translated into English can be accessed on the Réseau Technoscience website.

- Rules
- Teacher's Guide
- Student Handbook
- Slideshow (*Google Slides, PPT and PDF formats*)
- Junior Tech Certificate of Participation
- Carton de notation pour saisie du pointage (*French only*)
- Tableau de pointage Excel (*French only*)
- Fiche de vérification des prototypes (*French only*)

PREPARATORY ACTIVITIES

The preparatory activities aim to help students acquire scientific concepts related to the challenge. They also help develop strategies that support students in the development of science-specific competencies.

While the activities can be conducted independently, their significance may diminish if not integrated into a meaningful context where students can apply their knowledge within an authentic production. The activities suggested in this LES allow students to become familiar with the design process and to allow the teacher to collect traces of the following competencies in Science and Technology:

- Competency 1: To propose explanations for or solutions to scientific or technological problems.
- Competency 2: To make the most of scientific and technological tools, objects, and procedures.
- Competency 3: To communicate in the languages used in science and technology.

All activities allow students to establish concrete links with scientific concepts anchored in the Progression of Learning Science and Technology and the Québec Education Program.

FROM A CLASSROOM **LES** TO THE REGIONAL FINALS

The **Junior Tech Challenge** is an authentic learning opportunity in which students experience a Science and Technology design in the classroom. They are invited to compete in one of the many levels of competition - with the ultimate experience of participating at the Regional Finals!

Here are the different levels of finals:

Class Finals	These finals are organized in class and will determine the most efficient prototypes that will move on to the next level: • The school final. • The school service center or school board final (*if there is no school final*). • The Regional Final (*if there is no school, school service center or school board final*).
School Finals	School Finals are organized per cycle to determine the representatives who will go to the school service center or school board finals. If there are no finals in the school service center or school board, they will go directly to the Regional Finals.
School Service Center Finals or School Board Finals	These finals are organized per cycle by the school service center or school board, or in collaboration with Réseau Technoscience. If the school service center or school board is planning on holding finals, students will have to register to these finals **first.**
Regional Finals	Regional Finals are organized per cycle and bring students from their region together. Réseau Technoscience organizes 11 regional finals which will take place in May. Consult the calendar for the date of your Regional Finals. To register teams, contact the Regional Coordinator of the Junior Tech Challenge. The contact information is available on the website.

Note: During the Regional Finals, the challenge can be presented in a different format to that presented in the school service center, or school board finals. The students will be required to change their strategy to adapt to this new format. No advanced preparation is needed, but extra time will be given to students to make the necessary changes.

PROGRESSION OF LEARNING

PROGRESSION OF LEARNING FOR SCIENCE AND TECHNOLOGY

The intention of this Learning and Evaluation Situation (LES) is to foster the development of students' skills, particularly those associated with the technological design process. Many of these skills are detailed in the activities outlined in the Teacher's Guide. The details of the concepts targeted in each of the activities, and the links with the Progression of Learning are presented below.

KNOWLEDGE APPLIED IN THE LES

This LES incorporates the following knowledge from the Progression of Learning Science and Technology :

SCIENCE AND TECHNOLOGY

MATERIAL WORLD

→	Student constructs knowledge with teacher guidance.	Elementary					
*	Student applies knowledge by the end of the school year.						
	Student reinvests knowledge.	Cycle 1		Cycle 2		Cycle 3	
A. MATTER		**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**
1. Properties and characteristics of matter							
e. Describes the shape, colour and texture of an object or a substance				→	*		
C. FORCES AND MOTION		**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**
3. Gravitational attraction on an object							
a. Describe the effect of gravitational attraction on an object (*e.g. free fall*)						→	*
4. Pressure							
a. Recognizes various manifestations of pressure *(e.g. inflatable balloon, atmospheric pressure, airplane wing)*						→	*
b. Describes the effects of pressure on an object *(e.g. compression, displacement, increase in temperature)*						→	*
5. Characteristics of motion							
a. Describes the characteristics of motion *(e.g. direction, speed)*				→	*		

→	Student constructs knowledge with teacher guidance.	Elementary					
*	Student applies knowledge by the end of the school year.						
	Student reinvests knowledge.	Cycle 1		Cycle 2		Cycle 3	
6. Effects of a force on the direction of an object							
a. Identifies situations involving the force of friction *(pushing on an object, sliding an object, rolling an object)*		→	*				
c. Describes the effects of a force on an object *(e.g. Sets it in motion, changes its motion, stops it)*				→	*		
7. Combined effects of several forces on an object							
a. Predicts the combined effect of several forces on an object at rest or an object moving in a straight line *(e.g. reinforcement, opposition)*						→	*
D. SYSTEMS AND INTERACTION		**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**
1. Everyday technical objects							
b. Identifies the needs that an object was originally designed to meet		→	*				
E. TECHNIQUES AND INSTRUMENTATION		**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**
1. Use of simple measuring instruments							
a. Appropriately uses simple measuring instruments *(rulers, dropper, graduated cylinder, balance, thermometer, chronometer)*				→	→	→	*
4. Design and manufacture of instruments, tools, machines, structures *(e.g. bridges, towers)*, devices *(e.g. water filtration device)*, models *(e.g. glider)* and simple circuits							
b. Interprets a diagram or a plan containing symbols				→	→	→	*
F. APPROPRIATE LANGUAGE		**1st**	**2nd**	**3rd**	**4th**	**5th**	**6th**
1. Terminology related to an understanding of the material world							
a. Appropriately uses terminology related to the material world		→	→	→	→	→	*
b. Distinguishes between the meaning of a term used in a scientific or technological context and its meaning in everyday language *(e.g. source, matter, body, energy, machine)*		→	→	→	→	→	*
2. Conventions and types of representations specific to the concepts studied							
a. Communicates using appropriate types of representations that reflect the rules and conventions of science and technology *(e.g. symbols, graphs, tables, drawings, sketches, norms and standardization)*				→	→	→	*

STRATEGIES

EXPLORATION STRATEGIES

- Distinguishing between the different types of information useful for solving the problem.
- Recalling similar problems that have already been solved.
- Becoming aware of his or her previous representations.
- Drawing a diagram for the problem or illustrating it.
- Formulating questions.
- Putting forward hypotheses *(e.g. individually, as a team, as a class)*.
- Exploring various ways of solving the problem.
- Anticipating the results of his or her approach.
- Imagining solutions to a problem in light of his or her explanations.
- Taking into account the constraints involved in solving a problem or making an object *(e.g. specifications, available resources, time allotted)*.
- Examining his or her mistakes in order to identify their source.
- Using different types of reasoning *(e.g. induction, deduction, inference, comparison, classification)*.
- Using empirical approaches *(e.g. trial and error, analysis, exploration using one's senses)*.

STRATEGIES FOR RECORDING, USING AND INTERPRETING INFORMATION

- Using technical design to illustrate a solution *(e.g. diagrams, sketches, technical drawings)*.
- Using different tools for recording information *(e.g. diagrams, graphs, procedures, notebooks, logbook)*.

COMMUNICATION STRATEGIES

- Using different means of communication to propose explanations or solutions (*e.g. oral presentation, written presentation, procedure)*.
- Using tools to display information in tables and graphs or to draw a diagram.
- Organizing information for a presentation *(e.g. tables, diagrams, graphs)*.
- Exchanging information.
- Comparing different possible explanations for, or solutions to, a problem in order to assess them *(e.g. full-group discussion)*.

OVERVIEW

DESCRIPTION	TIME	PEDAGOGICAL RESOURCES
PREPARATION		
Setting the Stage The teacher presents the challenge to the students but does not give them all the details. The rules will be presented at a later time.	15 minutes	• Student Handbook p. 2-3 • Slideshow • Intensive ESL Extras Appendix 2B, 2C, 2D
Activity 1: First Flight Students will analyze the behavior of a paper airplane in flight and will observe what happens when the plane's winglets are oriented in different ways.	60 to 120 minutes	• Student Handbook p. 4-9 • Intensive ESL Extras Appendix 2E
Activity 2: It's All About the Design! Students will observe how gravity and air resistance act on objects. They will be able to infer how these forces affect the flight of their paper airplane.	20 minutes	• Student Handbook p. 10-12
Activity 3: Which Models Will You Choose? Students will explore different folding techniques in their search for an airplane model for their design. They will be able to determine the effective features of a paper airplane by comparing the flight of different models. These manipulations can help them make decisions during the design phase.	60 to 120 minutes	• Student Handbook p. 13-15 • Appendix p. 29-41
IMPLEMENTATION		
Preparing to Meet the Challenge & All Aboard! The teacher will present the rules of the competition to the students. The students will research aircraft models for testing.	45 minutes	• Slideshow • Student Handbook p. 16-17 • Intensive ESL Extras Appendix 2F, 2G
One, Two, Three, Testing! Students will experiment with different possible aircraft models and determine which ones they will use in the challenge.	120 minutes	• Student Handbook p. 18-24
Time for Take Off! Students will carry out the challenge.	60 minutes	• Student Handbook p. 25
REVIEW AND REFLECT		
The teacher and the students will review the design and the construction of their aircraft, and the strategies that will be used to carry out the task.	15 minutes	• Student Handbook p. 26 • Intensive ESL Extras Appendix 2A

SUPPLEMENTARY ACTIVITIES AND VIDEO CAPSULES

Enhanced content, including supplementary activities and video capsules, will be accessible on the *Outils et Règlements* section of our website during specific phases of the challenge. Stay informed by regularly checking this updated section or subscribe to our Facebook page, La science techno en mode pratique, for notifications on when these resources will be made available.

Additionally, for students learning ESL in an Intensive context, activity suggestions, graphic organizers, and evaluation tools can be found in **Appendix 2: ESL Extras**.

SETTING THE STAGE

Pedagogical Intentions

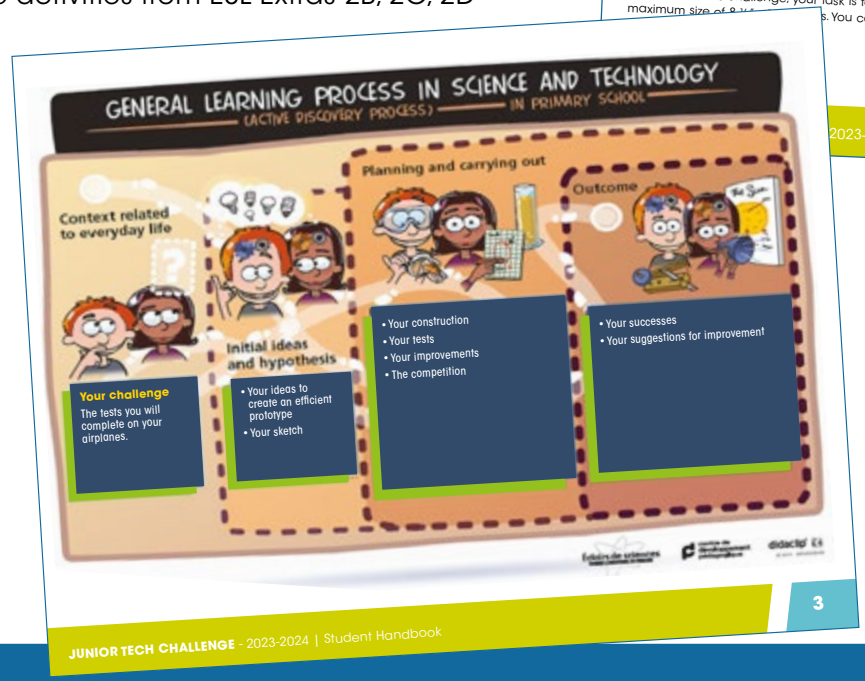
- Present the LES *(Learning and Evaluation Situation)* and the challenge.
- Generate student interest.

Materials

- Student Handbook p. 2-3
- Slideshow
- Intensive ESL Extras Appendix 2B, 2C, 2D

Procedure

1. Introduce the LES and outline the challenge using the slide show and/or the Student Handbook.
2. Distribute the Student Handbook to generate interest.
3. For Intensive ESL: Complete any or all of the activities from ESL Extras 2B, 2C, 2D



ACTIVITY 1 – FIRST FLIGHT

Pedagogical Intentions

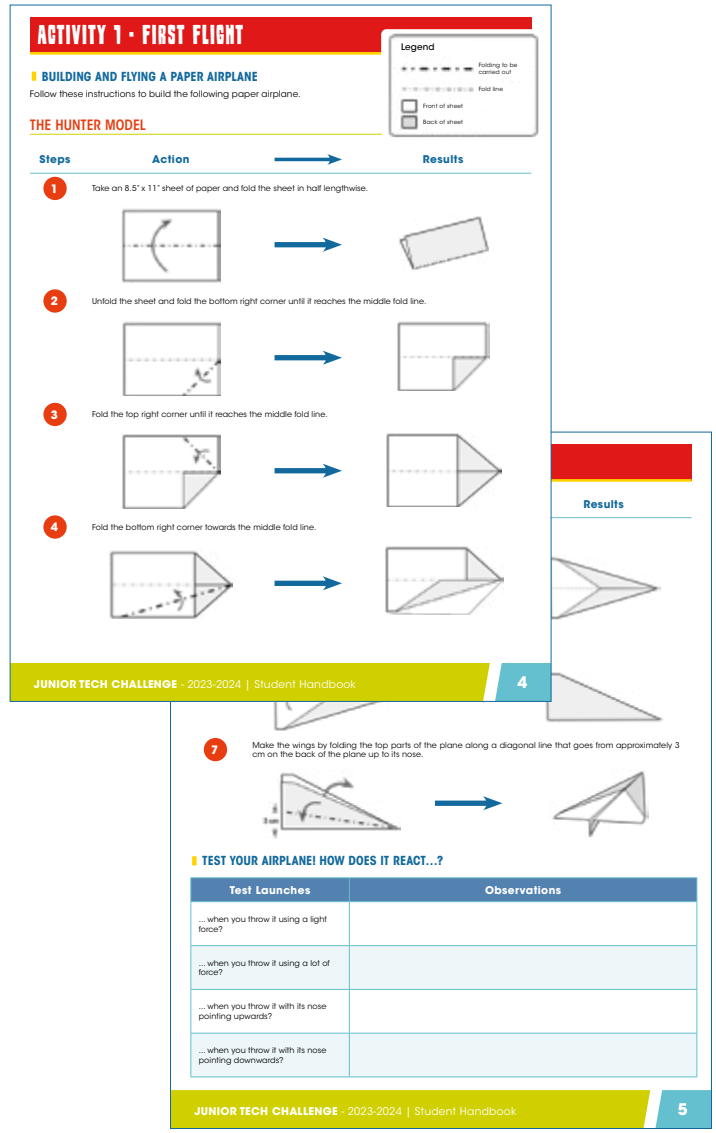
- To observe the pattern of flight of a paper airplane.
- To observe the airplane's flight pattern when the winglets are oriented in different ways.

Materials

- Student Handbook p. 4-9
- Letter-sized printing paper *(up to 8 ½" x 11"). (We strongly encourage the use of reused/ recycled paper.)*
- Adhesive tape, if needed
- Scissors
- Intensive ESL Extras Appendix 2E

Procedure

1. Present "The Hunter" airplane model. Review the steps with students and present this short video capsule, to help them visualize the different steps.
2. Distribute a sheet of paper and a pair of scissors to each student.
3. The students build "The Hunter" following the steps provided.
4. The students test the airplane's flight patterns. They will test different throwing techniques and note and share their observations.
   How does the airplane behave…
   … when we throw it using a light force?
   … when we through it with a lot of force?
   … when we throw it with its nose in pointing upward?
   … when we throw it with its nose pointing downward?
5. If the airplane doesn't fly well:
   - Have the students refine their folding technique by making another airplane.
   - Stick the right and left parts of the airplane together using adhesive tape.
   - Have the students review their throwing technique. An airplane thrown too strongly (or too lightly) may crash quickly.
6. For Intensive ESL learners, show the video suggested in Appendix 2E, and ask students to complete the table.


ACTIVITY 1 · FIRST FLIGHT

BUILDING AND FLYING A PAPER AIRPLANE

Follow these instructions to build the following paper airplane.

THE HUNTER MODEL

Legend

Folding to be carried out

Fold line

Front of sheet

Back of sheet

Steps | Action → | Results

1 Take an 8.5" x 11" sheet of paper and fold the sheet in half lengthwise.

2 Unfold the sheet and fold the bottom right corner until it reaches the middle fold line.

3 Fold the top right corner until it reaches the middle fold line.

4 Fold the bottom right corner towards the middle fold line.

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Results

7 Make the wings by folding the top parts of the plane along a diagonal line that goes from approximately 3 cm on the back of the plane up to its nose.

TEST YOUR AIRPLANE! HOW DOES IT REACT...?

Test Launches	Observations
... when you throw it using a light force?	
... when you throw it using a lot of force?	
... when you throw it with its nose pointing upwards?	
... when you throw it with its nose pointing downwards?	

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ACTIVITY 1 – FIRST FLIGHT (CONTINUED)

7. Have the students share their observations with the class.

8. Ask the students to cut the winglets as indicated in the instructions on page 6 of their Student Handbook.

9. Ask the students to position the winglets as suggested.

10. Instruct the students to formulate a hypothesis regarding the expected outcome of the airplane with this winglet configuration and mark an X in the corresponding box on page 7 to indicate their hypothesis.

11. Instruct the students to conduct three tests of their airplane to observe its flight behavior. Then, record their observations in their Student Handbook.

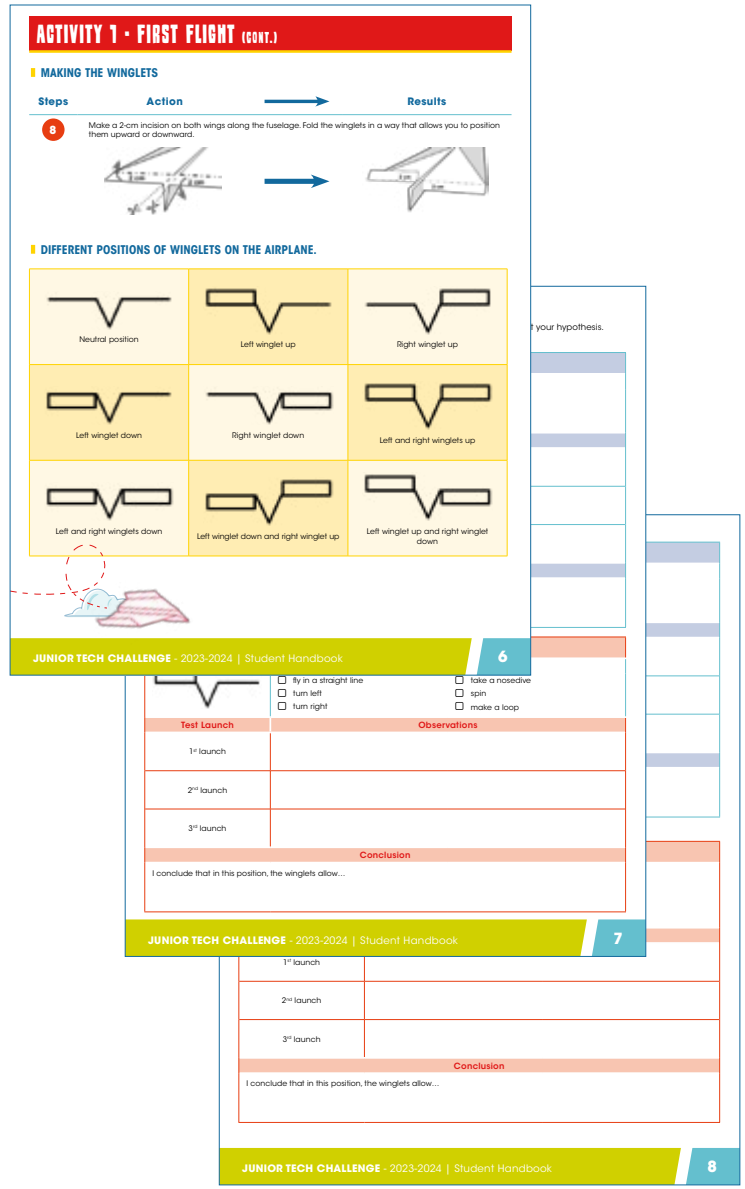
12. Ensure that the students check the position of the winglets after each flight, as their manipulation may have altered them. This could lead to erratic and varied flight behavior from one flight to the next.

13. Ask the students to draw a conclusion linking the airplane's flight behaviour to the position of its winglets and to note this in the tables provided in their Student Handbook.

14. Repeat this for "My Second Flight," "My Third Flight," etc.

15. When they are done, review the activity with the class. Here are a few questions that could be explored with the students:
    - What difficulties did you encounter? How did you overcome them?
    - What are the differences between your hypotheses and your observations? What do you think about these differences?
    - What are the winglet positions that allow you to easily observe the flight behaviour? Which configurations were more difficult to observe?

16. For Intensive ESL learners, complete the activity from ESL Extras 2E.



ACTIVITY 2 – IT'S ALL IN THE DESIGN!

Pedagogical Intentions

- To observe and understand how gravity and air resistance act on objects.
- To observe how these forces have an impact on a gliding paper airplane.

Materials

- Student Handbook p. 10-12
- One book and two identical sheets of paper per student *(We strongly encourage using reused/recycled paper.)*
- Two 2-liter plastic bottles
- Tap water

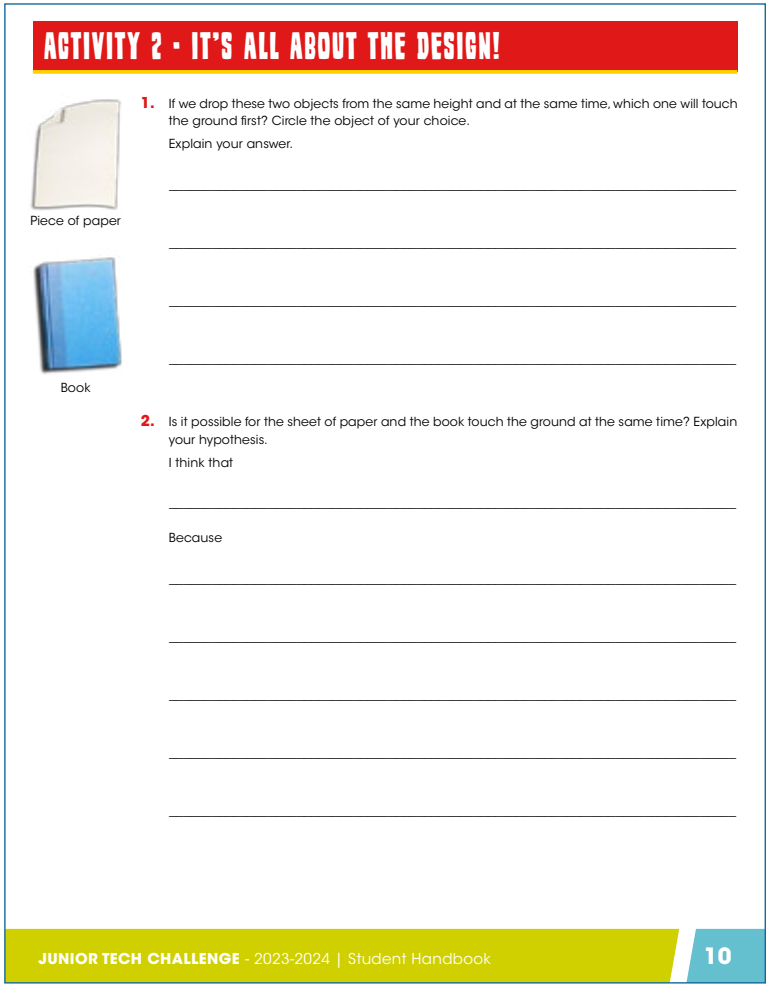
Procedure

Demonstration with a book and a sheet of paper

1. Ask the students to formulate a hypothesis for the following question: If we drop a book and a sheet of paper from the same height and at the same time, which one will hit the ground first? Then ask students to circle the object they chose and explain their answer on page 10 of the Student Handbook.

2. Demonstrate in front of the class:
   - Hold the book and the sheet of paper at the same height and drop them at the same time. *(The book will hit the ground first.)*

3. Ask the students how they think it would be possible to have the book and the sheet of paper hit the ground at the same time. Then ask them to write their hypothesis and explanation in their Student Handbook.
   - Solution: Crumple the sheet of paper. **Be careful not to reveal the solution to students at this moment!**



ACTIVITY 2 - IT'S ALL ABOUT THE DESIGN!

Piece of paper

Book

1. If we drop these two objects from the same height and at the same time, which one will touch the ground first? Circle the object of your choice.
   Explain your answer.

2. Is it possible for the sheet of paper and the book touch the ground at the same time? Explain your hypothesis.
   I think that

   Because

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ACTIVITY 2 – IT'S ALL IN THE DESIGN! (CONTINUED)

Demonstration with water bottles

4. Once the students have made their predictions, do the following:

- Take 2 identical plastic bottles.
- Fill only one with water and screw on the cap.
- Drop both bottles from the same height and at the same time.

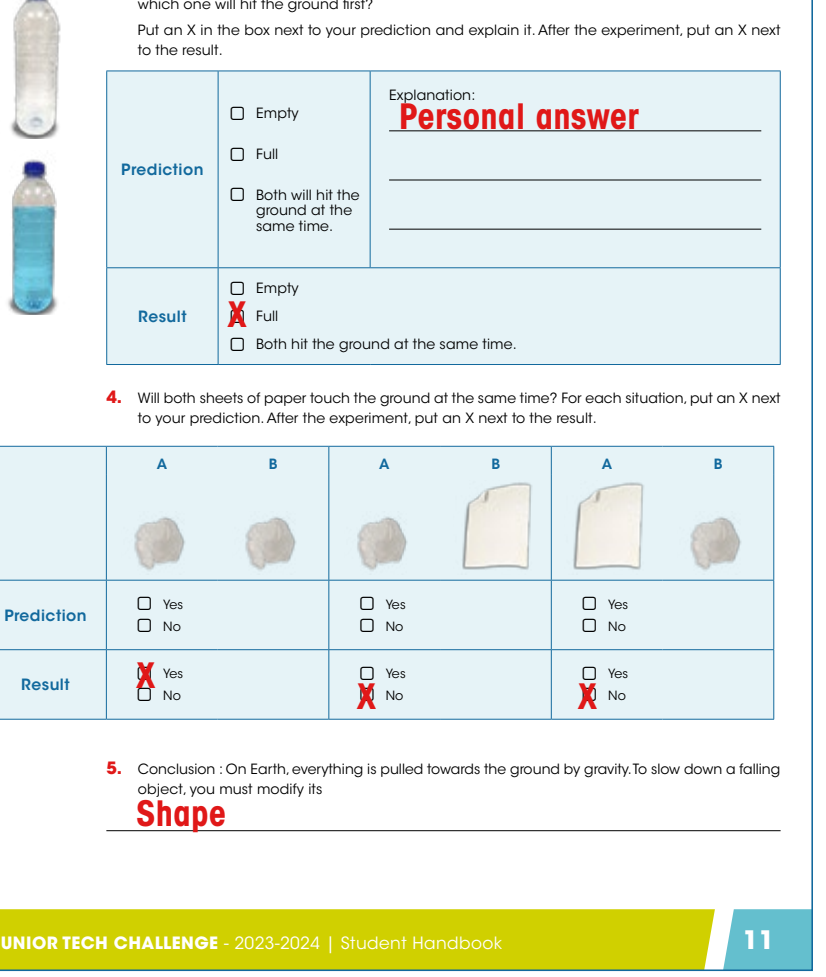
Note: This demonstration works well with 2-litre plastic bottles.

Demonstration with crumpled sheet of paper

This task can be carried out by the teacher or by each team.

5. The students make their predictions and then carry out the following experiment:

- Take 2 sheets of paper.
- Write A on one sheet and B on the other.
- Crumple both sheets into balls.
- Drop both sheets from the same height and at the same time, and note your observations.
- Smooth out sheet B.
- Drop both sheets and note your observations.
- Crumple sheet B and smooth out sheet A.
- Drop both sheets and note your observations.



ACTIVITY 2 - IT'S ALL ABOUT THE DESIGN! (CONT.)

3. If we drop both bottles (*one empty and one full*) at the same time from a one-meter height, which one will hit the ground first?

Put an X in the box next to your prediction and explain it. After the experiment, put an X next to the result.

Prediction	☐ Empty ☐ Full ☐ Both will hit the ground at the same time.	Explanation: **Personal answer**
Result	☐ Empty ☒ Full ☐ Both hit the ground at the same time.	

4. Will both sheets of paper touch the ground at the same time? For each situation, put an X next to your prediction. After the experiment, put an X next to the result.

	A	B	A	B	A	B
Prediction	☐ Yes ☐ No		☐ Yes ☐ No		☐ Yes ☐ No	
Result	☒ Yes ☐ No		☐ Yes ☒ No		☐ Yes ☒ No	

5. Conclusion : On Earth, everything is pulled towards the ground by gravity. To slow down a falling object, you must modify its **Shape**

ACTIVITY 2 – IT'S ALL IN THE DESIGN! (CONTINUED)

6. Review the findings of the demonstrations and the experiment and, through discussion, lead students to the following conclusions:

Why did the crumpled sheet of paper hit the ground at the same time as the book, while the uncrumpled sheet took longer? The uncrumpled sheet of paper is not heavier. Unlike what the students may have thought at first, **the weight** of the object is not a determining factor in the experiment. It's all about **the shape** *(or the design)* of the object. While falling, the uncrumpled sheet of paper has a larger surface area in contact with the air. The resistance the air applies onto the sheet of paper slows it down *(drag)*. All objects are attracted to the ground by the force of gravity, which acts like a magnet pulling them downward. Without the resistance of the air, two objects *(with different masses and shapes)* dropped at the same time from the same height, will hit the ground at the same time. *(See video capsule suggestions below.)*

7. After the discussion, ask students to answer the question on page 12 of their Student Handbook.

8. Suggested Video Capsules

- **Video from NASA (0:47)**

  https://www.youtube.com/watch?v=5C5_dOEyAfk

  This video shows an astronaut who drops a feather and a hammer on the moon. Without air resistance, they both land at the same time.

- **Video from the BBC (4:41)**

  https://www.youtube.com/watch?v=E43-CfukEgs

  Brian Cox visits the NASA Space Power Facility in Ohio to see what happens when a bowling ball and a feather are dropped at the same time and under the same conditions in outer space.

ACTIVITY 3 – WHICH MODELS WILL YOU CHOOSE?

Pedagogical Intentions

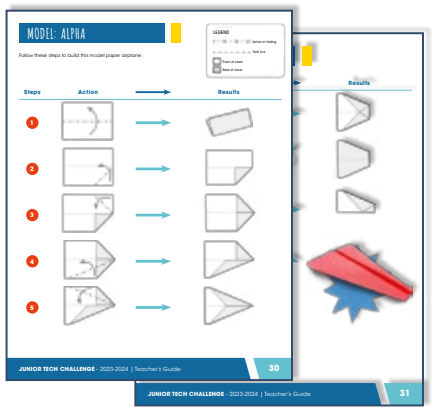
- Encourage students to explore the different folding techniques they might encounter in their search for aircraft models for their design.
- Help students determine the most effective features of a paper airplane in relation to the challenge to be carried out.
- Compare the flight of different aircraft models and compare peer observations to help with design choices.

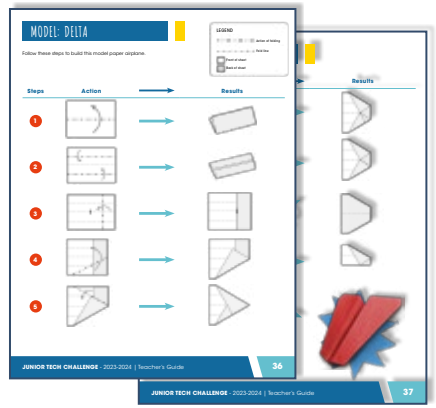
Materials

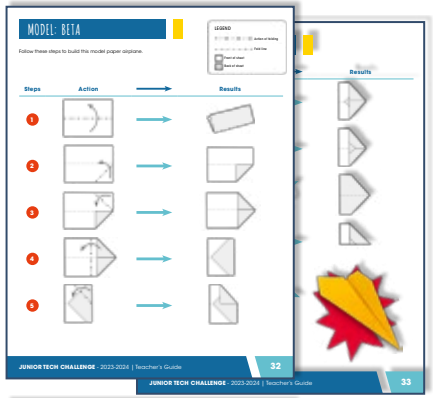
- Letter-sized printing paper *(up to 8 ½" x 11") (We strongly encourage using reused/recycled paper.)*
- Adhesive tape
- Scissors
- Appendix p. 29–41 in Teacher's Guide
- Student Handbook p. 13-15

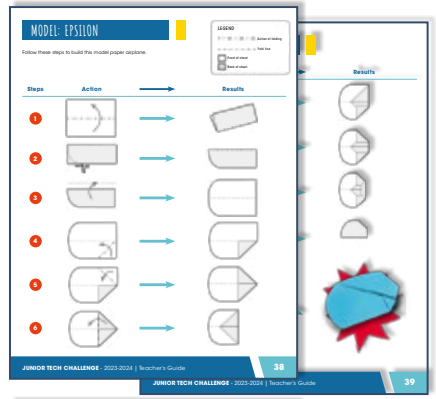
Procedure

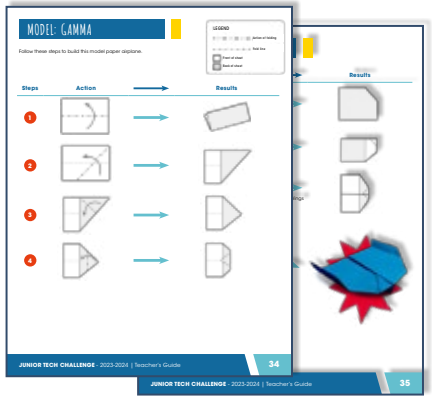
1. Present the six paper airplane models in Appendix 1 of the Teacher's Guide. Print them according to your needs.
2. Give the students time to go over the six models.
3. Invite students to choose 2 or 3 models from those offered. This number may vary according to the student's interest and ability to build them.
4. Distribute a sheet of paper and a pair of scissors to each student.
5. Ask students to follow the folding plan for each of their selected models, emphasizing the importance of making each fold accurately.

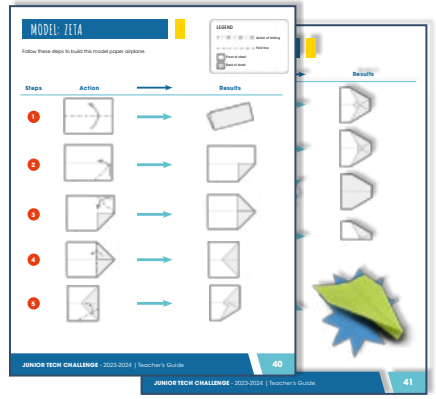












ACTIVITY 3 – WHICH MODELS WILL YOU CHOOSE? (CONTINUED)

6. Students test each of their prototypes and note their observations in their Student Handbook according to the following three types of observations:

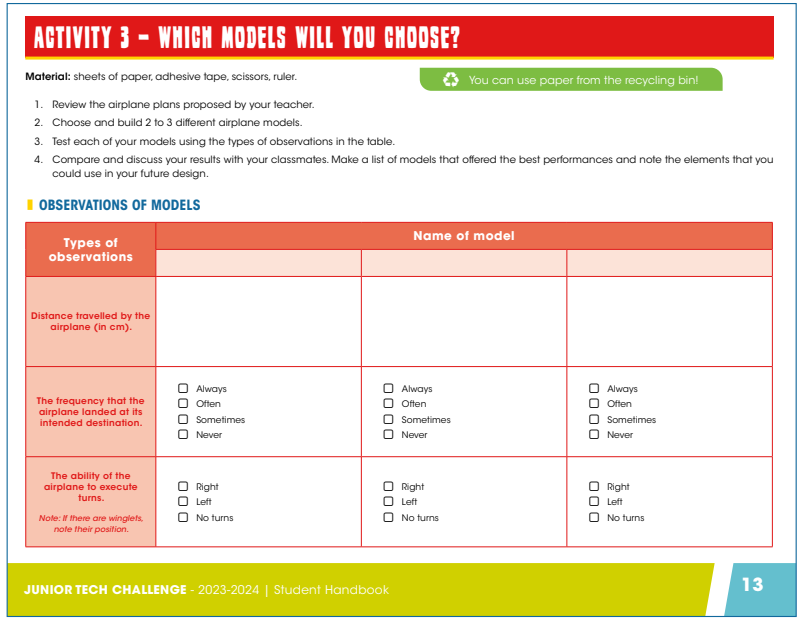
- Distance travelled by the airplane *(in cm)*.
- The airplane's ability to land in the same place after several throws *(precision)*.
- The airplane's ability to turn when winglets are cut out or when the wings are folded.

Note: Ask students to perform several tests (about 3) to observe each of these parameters.

7. Students compare their results and determine which prototype had the best performance for each of the three observations.

- Which model will fly the furthest distance?
- Which model will be the most precise in reaching a target on the ground?
- Which model has the ability to make both right and left turns?

8. Students note their observations, aiming to identify various flight behaviors based on observed aircraft characteristics *(aircraft shape, wing shape or position, influence of winglets, influence of force or pitch angle, etc.)*.



ACTIVITY 3 – WHICH MODELS WILL YOU CHOOSE?

Material: sheets of paper, adhesive tape, scissors, ruler.

You can use paper from the recycling bin!

1. Review the airplane plans proposed by your teacher.
2. Choose and build 2 to 3 different airplane models.
3. Test each of your models using the types of observations in the table.
4. Compare and discuss your results with your classmates. Make a list of models that offered the best performances and note the elements that you could use in your future design.

OBSERVATIONS OF MODELS

Types of observations	Name of model		
Distance travelled by the airplane (in cm).			
The frequency that the airplane landed at its intended destination.	☐ Always ☐ Often ☐ Sometimes ☐ Never	☐ Always ☐ Often ☐ Sometimes ☐ Never	☐ Always ☐ Often ☐ Sometimes ☐ Never
The ability of the airplane to execute turns. *Note: If there are winglets, note their position.*	☐ Right ☐ Left ☐ No turns	☐ Right ☐ Left ☐ No turns	☐ Right ☐ Left ☐ No turns

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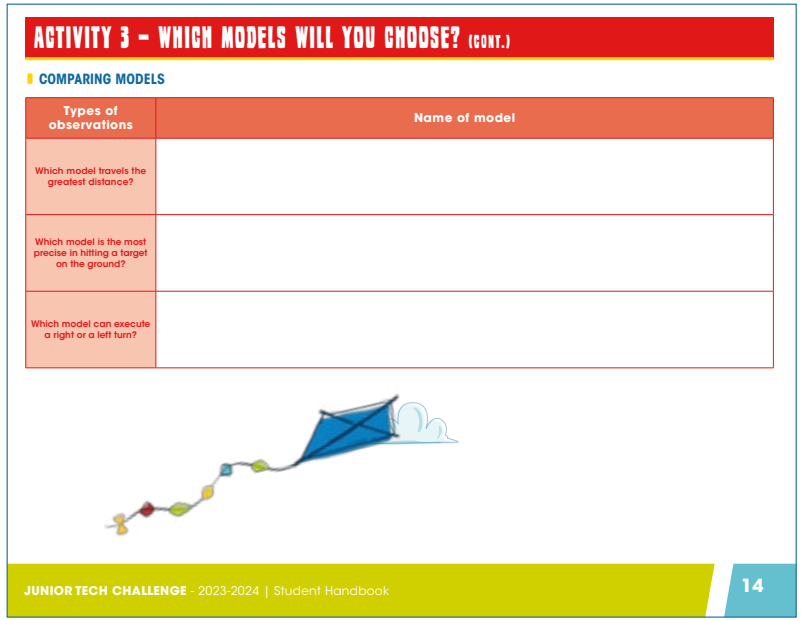

ACTIVITY 3 – WHICH MODELS WILL YOU CHOOSE? (CONT.)

COMPARING MODELS

Types of observations	Name of model
Which model travels the greatest distance?	
Which model is the most precise in hitting a target on the ground?	
Which model can execute a right or a left turn?	

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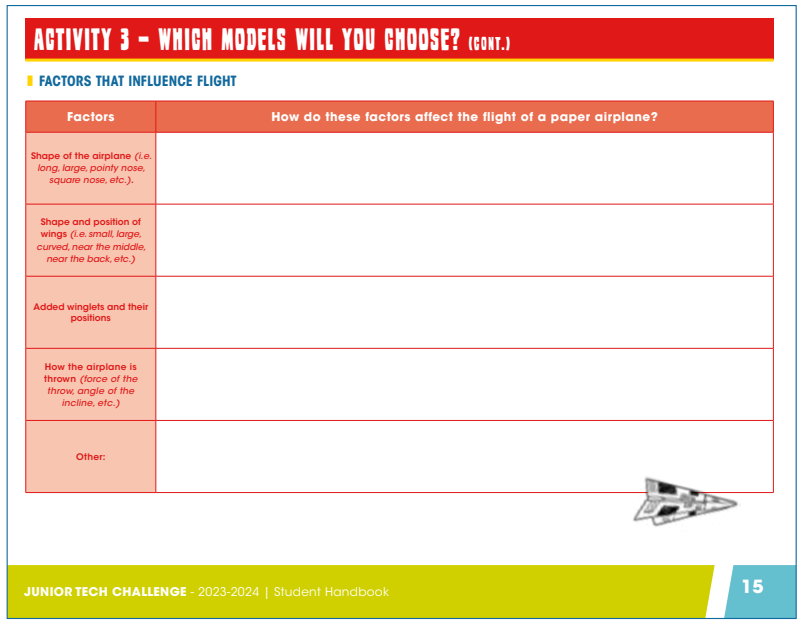
ACTIVITY 3 – WHICH MODELS WILL YOU CHOOSE? (CONTINUED)

9. The teacher guides a class discussion to compare and analyze the results of the tests. Students report on the characteristics of both the best-performing and worst-performing aircrafts, considering factors such as the distance flown, target accuracy, and turning ability. The discussion fosters an environment where students can identify key findings and reinvest these to refine the design of the airplanes and meet the challenge.

Here are a few examples of questions that can be explored with the students:

- How do the different models respond to the tests? *(performances is related to the different criteria that can be found in their Student Handbook)*
- How does the shape, size *(big, little, curved, etc.)* and position of the wings impact the airplane's flight?
- Does the addition of a winglet influence the airplane's flight? If yes, how?
- How does the strength applied when throwing the airplane impact its flight?
- How does the throwing angle or the way of throwing the airplane influence its flight behaviour?
- Which factors allowed the plane to go farther?
- Which factors allowed the plane to be precise and to reach a its target?
- Which factors allowed the plane to turn left or right?
- What impact did the quality and the precision of the folding have on the airplane's flight?



ACTIVITY 3 – WHICH MODELS WILL YOU CHOOSE? (CONT.)

FACTORS THAT INFLUENCE FLIGHT

Factors	How do these factors affect the flight of a paper airplane?
Shape of the airplane *(i.e. long, large, pointy nose, square nose, etc.).*	
Shape and position of wings *(i.e. small, large, curved, near the middle, near the back, etc.)*	
Added winglets and their positions	
How the airplane is thrown *(force of the throw, angle of the incline, etc.)*	
Other:	

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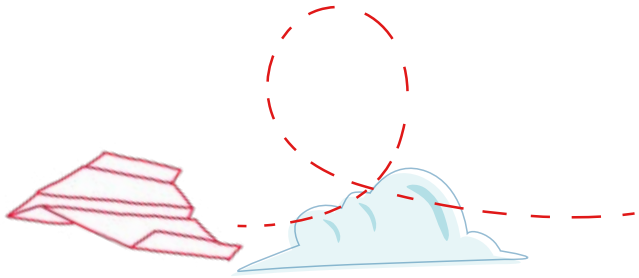


ACTIVITY 3 – WHICH MODELS WILL YOU CHOOSE? (CONTINUED)

10. Compile the results of the models tested by the students and document the pertinent observations in a shared table like the one below. This table can be presented to the entire class, generated by the students, or reproduced as necessary

TEST RESULTS **Write the name of the model tested and note or draw the characteristics that are important to remember.**		
TO FLY THE GREATEST DISTANCE	**TO REACH A TARGET**	**TO TURN LEFT OR RIGHT**

PREPARING TO MEET THE CHALLENGE

Pedagogical Intentions

- To consolidate the learning acquired during the process of designing a prototype.

Materials

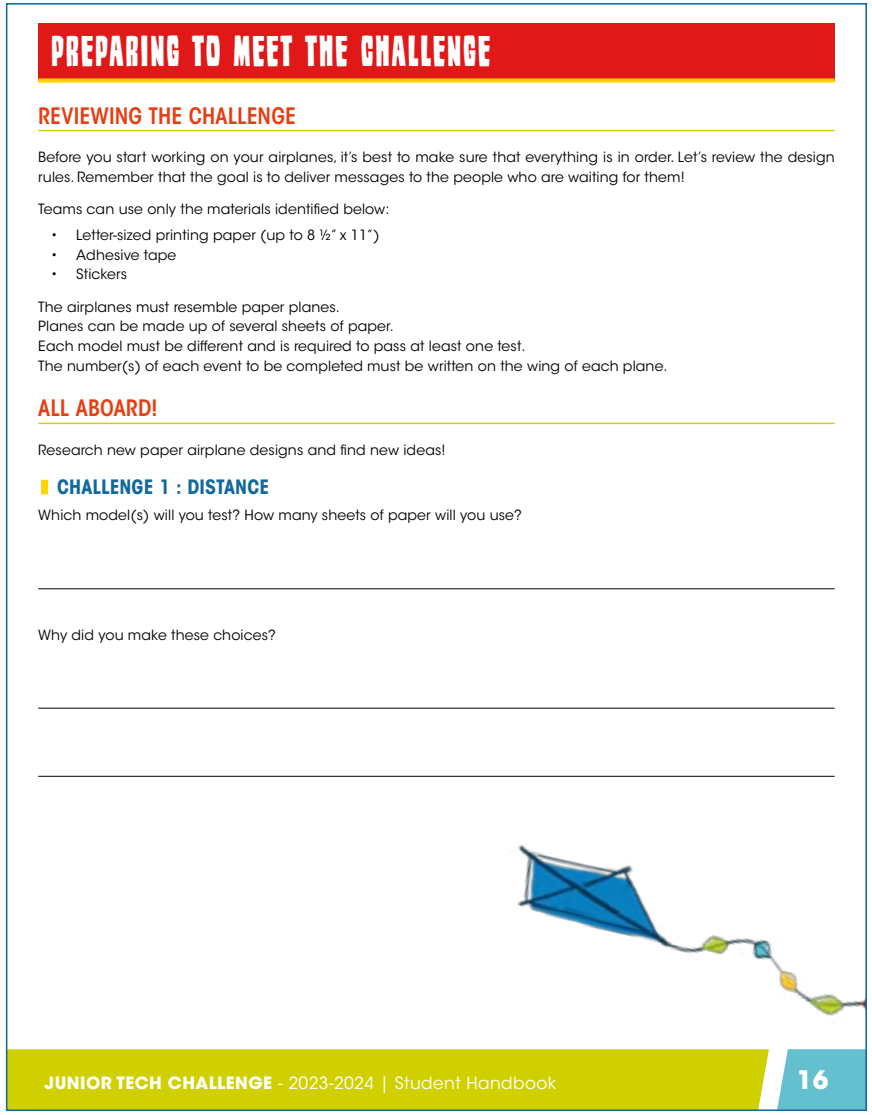
- Rules
- Slideshow

Setting the Scene

For the finals of the Junior Tech Challenge, students will be required to design paper airplanes that will complete various tasks.

Procedure

1. Use the presentation slides to review the rules of the challenge.
2. Use the Student Handbook to review the hypotheses discussed during the activities.
3. Ask the following questions to review and discuss what was learned from completing the activities:
   - Which factors influence the flight of a paper airplane?
   - What measures can you take to make sure your paper airplane launches with the best results?
   - How do winglets affect the flight of a paper airplane?
   - What shape should you give your airplane to make it float or glide longer?
   - Which models performed the best?
4. Arrange students into teams of 1-3.
5. Before building their paper airplanes teams must:
   - Collect all the materials needed.
   - Test different paper airplane models.



PREPARING TO MEET THE CHALLENGE

REVIEWING THE CHALLENGE

Before you start working on your airplanes, it's best to make sure that everything is in order. Let's review the design rules. Remember that the goal is to deliver messages to the people who are waiting for them!

Teams can use only the materials identified below:

- Letter-sized printing paper (up to 8 ½" x 11")
- Adhesive tape
- Stickers

The airplanes must resemble paper planes.
Planes can be made up of several sheets of paper.
Each model must be different and is required to pass at least one test.
The number(s) of each event to be completed must be written on the wing of each plane.

ALL ABOARD!

Research new paper airplane designs and find new ideas!

CHALLENGE 1 : DISTANCE

Which model(s) will you test? How many sheets of paper will you use?

Why did you make these choices?

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ALL ABOARD!

In teams, students must now decide which planes to use for the competition. They can select from those already presented in class, or they are encouraged to explore new models. technoscience.ca provides a page featuring various websites with suggested plans for different paper airplanes.

Materials

- Student Handbook p.16, 17
- Intensive ESL Extras 2F, 2G

Procedure

With their teammates, students discuss the various models and ideas that are presented for building their paper airplanes, choose the airplane models they'd like to test for each of the different trials, and answer the questions on pages 16 and 17.

PREPARING TO MEET THE CHALLENGE

REVIEWING THE CHALLENGE

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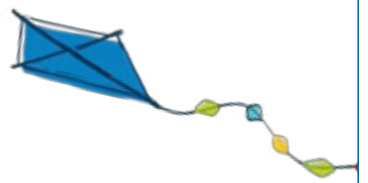


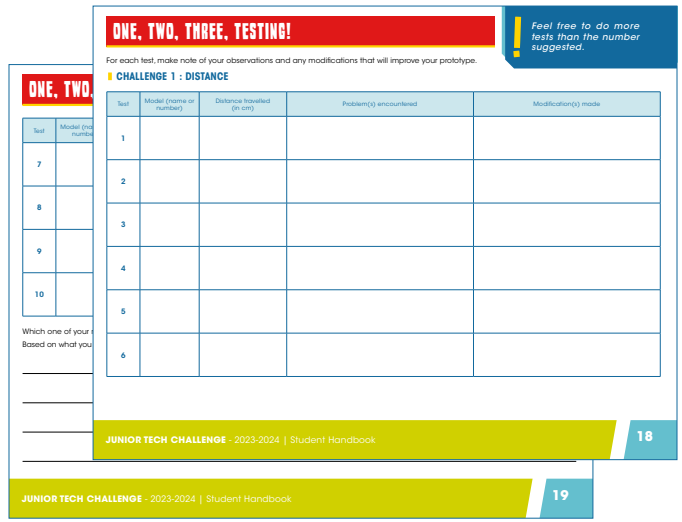
ONE, TWO, THREE, TESTING!

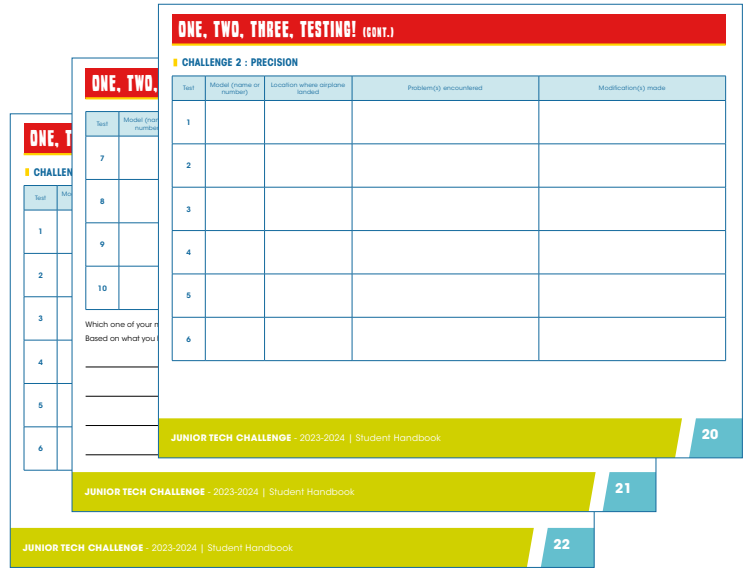
Materials

- Student Handbook p. 18-24
- Appendices p. 29-41 in Teacher's Guide
- Letter-sized printing paper (up to 8 ½" x 11")
- Adhesive tape/stickers
- Scissors

Procedure

1. Each team prepares their airplanes to prepare for testing.
2. Before testing, students must be reminded of the following:
   - Challenge 1: The aircraft must cover the greatest possible distance.
   - Challenge 2: The aircraft must land in a box placed in the competition area.
   - Challenge 3: The aircraft must turn right and/or left *(depending on the cycle)*.
   - The aircrafts must resemble a paper airplane *(ex.: a ball of paper cannot be considered an airplane)*.
   - Each aircraft must pass at least one test.
   - Each aircraft must be different.
   - The thrower must ensure that their feet do not cross the starting line.
   - For the turning challenge, airplanes must be launched perpendicular to the starting line.
3. Students note the performance of their paper airplanes, the problems they encounter, and the modifications they make, in the table of their Student Handbook p. 18-24.
4. During the testing of the paper airplanes, the teacher accompanies the students by questioning, encouraging and guiding them in their adjustments.

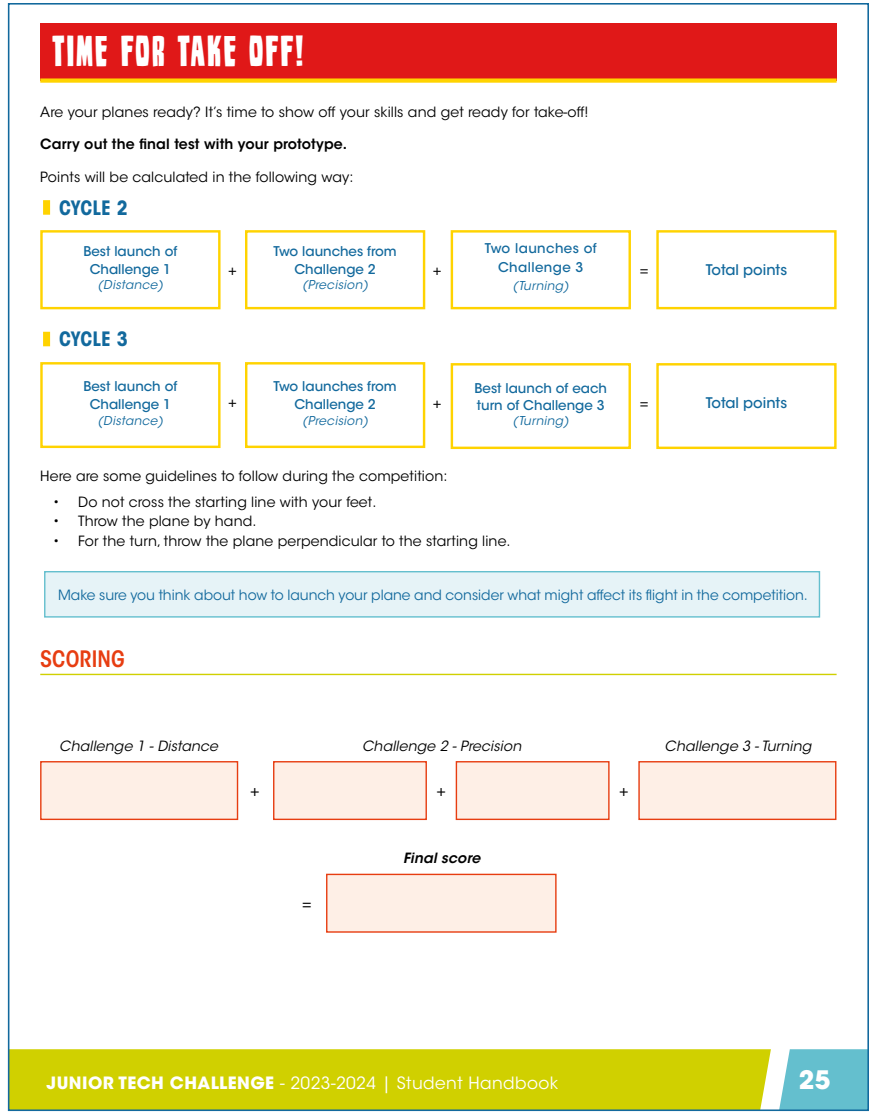




TIME FOR TAKE OFF!

You will find all the information regarding the competition in the Rules pages 5 to 8. Briefly, here are a few details to guide you in the organization of your final.

- For a class final, you do not have to impose a time limit.
- Students can use their own paper, or the class or school can provide some.
- If there are many teams participating, it is possible to prepare more than one competition area. In this case, make sure to have enough judges.
- When the competition is over, the students write down their points in their Student Handbook.
- Make sure that students of the same cycle complete all the challenges under identical conditions.



TIME FOR TAKE OFF!

Are your planes ready? It's time to show off your skills and get ready for take-off!

Carry out the final test with your prototype.

Points will be calculated in the following way:

CYCLE 2

Best launch of Challenge 1 *(Distance)*	+	Two launches from Challenge 2 *(Precision)*	+	Two launches of Challenge 3 *(Turning)*	=	Total points

CYCLE 3

Best launch of Challenge 1 *(Distance)*	+	Two launches from Challenge 2 *(Precision)*	+	Best launch of each turn of Challenge 3 *(Turning)*	=	Total points

Here are some guidelines to follow during the competition:

- Do not cross the starting line with your feet.
- Throw the plane by hand.
- For the turn, throw the plane perpendicular to the starting line.

Make sure you think about how to launch your plane and consider what might affect its flight in the competition.

SCORING

Challenge 1 - Distance		*Challenge 2 - Precision*		*Challenge 3 - Turning*
	+		+	+

Final score

=

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REVIEW AND REFLECT

Pedagogical Intentions

- To consolidate learning.
- To review the design and construction of the prototype, as well as the strategies used to complete the challenge

Materials

- Student Handbook p. 26
- Intensive ESL Extras 2A

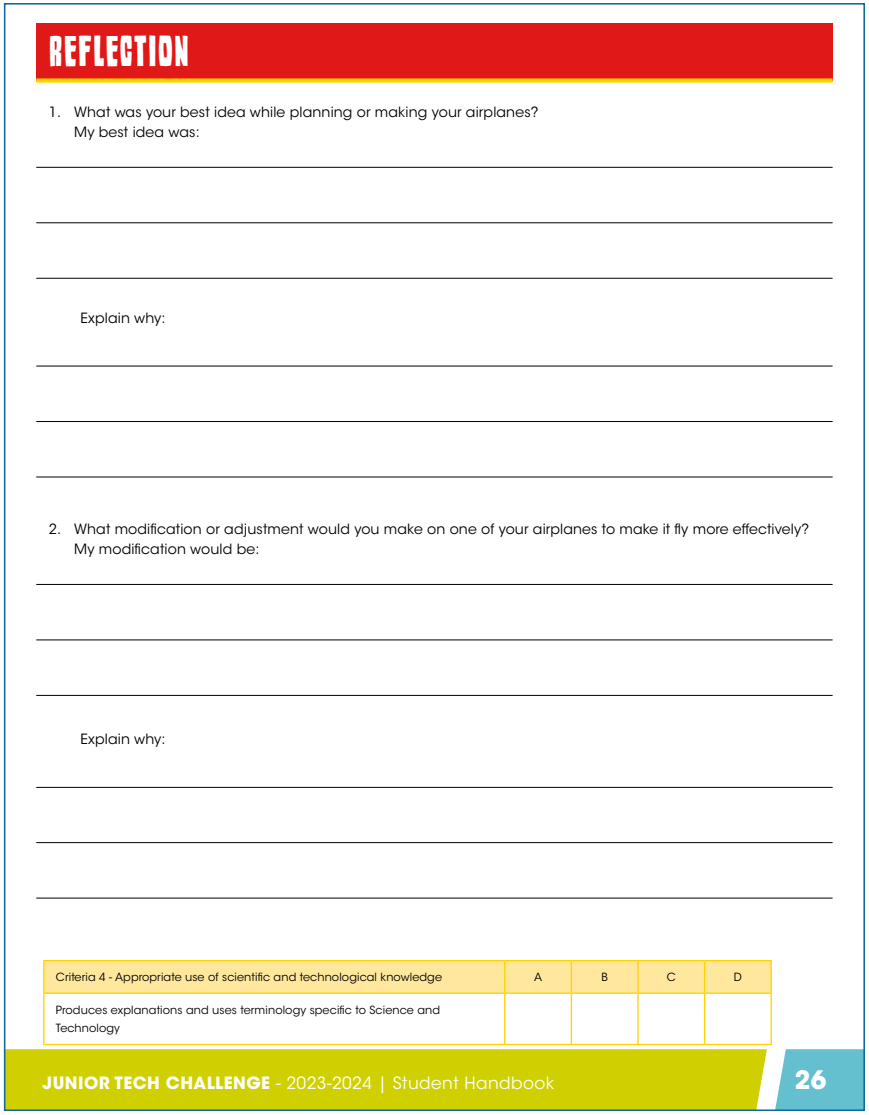
Procedure

Review and discuss the following questions as a group, then invite students to complete page 26 of their Student Handbook on their own.

1. Ask students to present their aircrafts, detailing their technical choices, any modifications made during the tests, and their final result.
2. Compare the different characteristics of the different aircrafts in the class:
   - Why were some prototypes more accurate or reliable in flight, etc.?
   - Was the choice of shape appropriate?
3. Ask students about the strategies used by the teams.
   Were some more effective than others?
4. Have students reflect on their performance using the questions on page 26 in their Student Handbook.
5. Ask students to discuss what they learned from this project.
6. For Intensive ESL learners, Appendix 2A suggests reflection activities that can be used throughout the challenge.

Frequently Asked Questions

The frequently asked questions are updated every week. Consult it regularly, and do not hesitate to send us your questions.



REFLECTION

1. What was your best idea while planning or making your airplanes?
   My best idea was:

Explain why:

2. What modification or adjustment would you make on one of your airplanes to make it fly more effectively?
   My modification would be:

Explain why:

Criteria 4 - Appropriate use of scientific and technological knowledge	A	B	C	D
Produces explanations and uses terminology specific to Science and Technology				

JUNIOR TECH CHALLENGE - 2023-2024 | Student Handbook 26

EVALUATION GRID – SCIENCE AND TECHNOLOGY

EVALUATION CRITERIA	A	B - C - D
Appropriate description of the problem	**Formulation of complete and relevant solutions** *(Student Handbook and observations made in class)* The student proposes, orally or in writing, relevant solutions that keep in mind at least 3 of the following constraints: • An aircraft must cover a great distance. • An aircraft must reach its target. • An aircraft must be able to turn right and left. *Note: We are not assessing whether or not the proposed solutions are viable. We want to check whether the student can identify the essential elements and give relevant provisional solutions before designing*	B : The student proposes a relevant solution, either orally or in writing, that addresses two of the three constraints mentioned in A. C : The student proposes a relevant solution, either orally or in writing, that addresses only one of the constraints listed in A. D : The student does not propose any relevant solutions either orally or in the Student Handbook.
Application of an appropriate procedure	**Readjustment of the design made during the testing phase** *(Student Handbook and observations made in class)* During the testing phase, the student identifies three problems encountered, and offers a number of relevant solutions for each, either orally or written. *Note: We are not assessing whether the proposed solutions are viable or not. We want to evaluate the descriptions of the trials where the modification to the problem has been made.*	B : During the testing phase, the student identifies two problems encountered, and offers a number of relevant solutions for each, either orally or in writing. C : During the testing phase, the student identifies one problem encountered, and offers a relevant solution, either orally or in writing. D : During the testing phase, the student does not identify any problems.
Appropriate use of instruments, tools or techniques	**Appropriate handling of tools and instruments** *(Observations made in class and on the airplane.)* The student appropriately uses the folding techniques taught in class.	B-C : The student appropriately uses the folding techniques taught in class. Some difficulties are observed. D : The student does not appropriately use the folding techniques taught in class.
Appropriate use of scientific and technological knowledge	**Produces explanations and uses terminology specific to Science and Technology** *(Student Handbook)* The student summarizes: • by describing their best idea AND a modification; • by using the terminology specific to Science and Technology.	B : The student summarizes by describing their best idea AND a modification. The student does not consistently use terminology specific to Science and Technology. C : The student summarizes by describing their best idea OR its modification, and by using the terminology specific to Science and Technology. D : The student simply presents their ideas without any explanation, or the explanation provided is not based on Science and Technology.

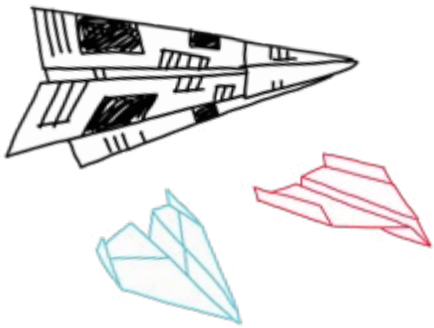
ADDITIONAL RESOURCES

BOOKS	
TARGET AUDIENCE	**TITLE AND REFERENCE**
Youth	**Avions de papier,** Stillinger, Doug. Toronto : Scholastic, 2012, 55 p. ISBN : 978-1-4431-1646-6 Document in French
Youth	**100 avions en papier : à plier et à faire voler,** Watt, Fiona. Londres : Usborne, 2012, ISBN : 978-1-4095-4132-5 Document in French
Youth	**100 avions en papier : à plier et à faire voler - Volume 2,** Tudor, Andy. Londres : Usborne, 2013, 200 p. ISBN : 978-1-4095-6037-1 Document in French
Youth	**How to Make Paper Airplanes,** Adams, B.B. Mankato, MN : The Childs World, 2014, 24 p. ISBN : 978-1-6232-3562-8 Document in English
Youth	**Ultimate Paper Airplanes for Kids : The Best Guide to Paper Airplanes!,** Dewar, Andrew. Tuttle, 2015, 160 p. ISBN : 978-4-8053-1363-3 Document in English
5-7 years old	**Les avions de papier,** Helmore, Jim, Jones, Richard, Paris : Kimane, 2020 ISBN : 978-2-3680-8725-1 Document in French
Youth	**Super avions en papier : découvre plus de 25 incroyables modèles à plier,** Collectif, Les Éditions de L'imprévu, 2016, 20 p. ISBN : 979-1-0295-0387-0 Document in French
Youth	**Avions en papier,** Antwerpen : Le Ballon, 2015, 95 p. ISBN : 9789037494501 Document in French
Youth	**Avions en papier: modèles originaux et innovants,** Ita, Sam, Ribordy, Céline, Chermignon : Nuinui Jeunesse, 2021 ISBN : 9782889571970 Document in French
Youth	**Avions en papier : 44 pliages à faire voler,** Gerber, Bruno, Baur, Ruth, Paris : Vigot, 2016, 120 p. ISBN : 9782711424139 Document in French

ADDITIONAL RESOURCES (CONTINUED)

For intensive ESL, see Appendix 2H, 2I, 2J, 2K for activity ideas, graphic organizers, and evaluation tools that can be used with these videos.

VIDEOS
Paper Man, Kahrs, John, 2012, États-Unis : Walt Disney Animation Studios https://www.dailymotion.com/video/xx6f6s Video short *Summary:* A man meets a woman waiting for a train in New York City. Finding her to his liking, he tries to attract her attention with paper airplanes. Will he succeed? Maybe, especially if his paper airplanes decide to lend him a helping hand.
Paper Plane, Lorenzetti, William, 2010, InkyMind https://vimeo.com/12259794 Video short *Summary:* A young boy with a vivid imagination creates a huge paper airplane and imagines becoming its pilot.
Soar, Tzue, Alyce, États-Unis : Academy of Art https://vimeo.com/148198462 Video short *Summary:* A young girl aspires to become an aeronautical engineer and tests her model airplanes daily, facing repeated failures. One day, a little boy falls from the sky after his flying ship breaks, and he urgently needs to return to his family. Realizing the boy's need for assistance, she taps into her genius to aid him.



PRODUCTION TEAM

Provincial Coordinator of the Junior Tech Challenge

Sara Gosselin

Design of the challenge and the pedagogical tools

Stéphane Coupal, *Centre de services scolaire de Laval*
Catherine Farrugia et Sebastien Filion, *Centre de services scolaire des Hautes-Laurentides*
Donald Gaudreau, *Centre de services scolaire de la Pointe-de-l'Île*
Audrey Girard et Emmanuelle Gingras, *Centre de services scolaire des Affluents*
Myriam Larue, *Centre de services scolaire des Mille-Îles*
Phylippe Laurendeau et Josiane Ducharme-Arbour, *Centre de services scolaire des Samares*
Chantal Pepin et Bénédicte Boissard, *Centre de services scolaire de la Rivière-du-Nord*
Robert Vivier, *Centre de services scolaire des Laurentides*
Mario Beaulieu, *Centre de services scolaire de Montréal*

Review of Pedagogical Tools

Antoine Schérer

Layout

Fabien Dumas

Illustrations

Élise Gravel

English adaptation and translation

Elizabeth Alloul, ESL Consultant, LEARN

learn

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Centre de services scolaire des Samares Québec
Centre de services scolaire de Montréal Québec

FORMATION CONTINUE
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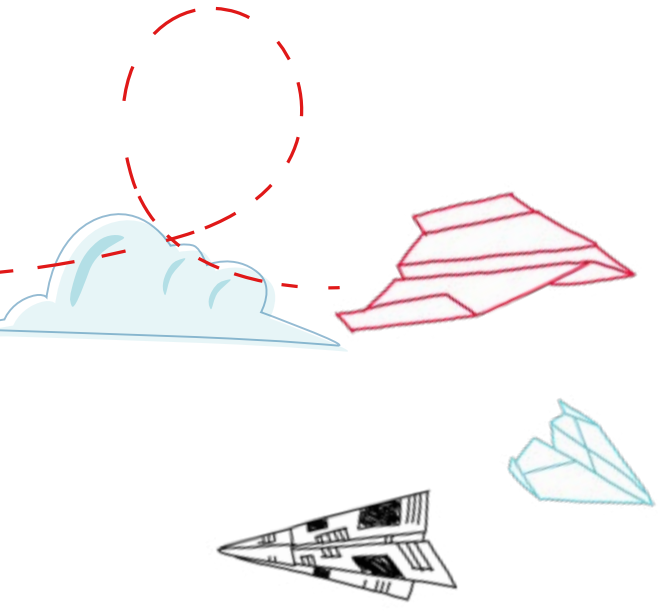
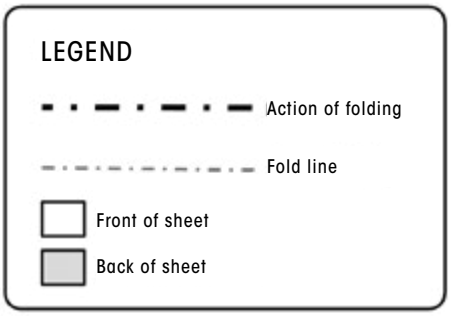
Offre de formations non créditées

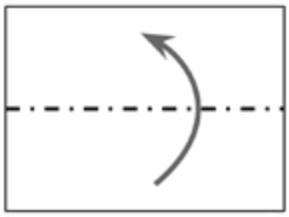
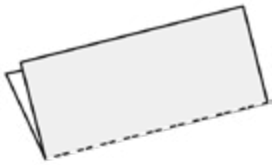
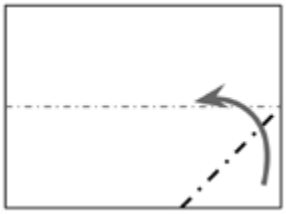
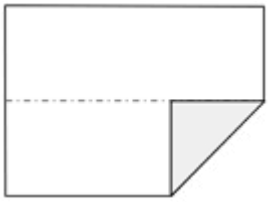
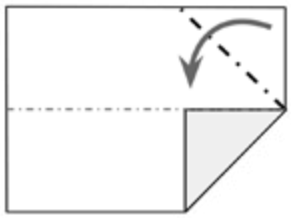
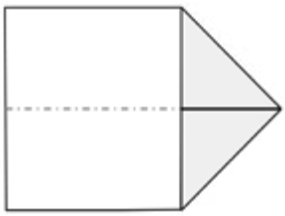
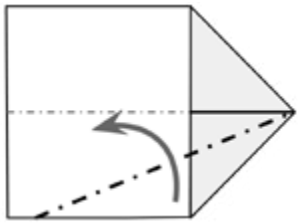
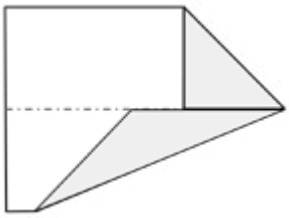
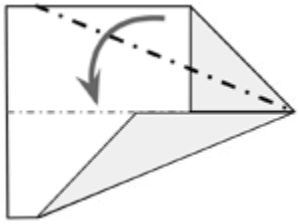
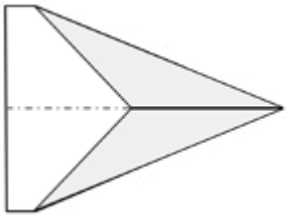
APPENDIX 1



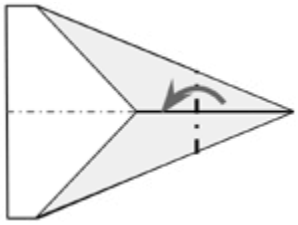
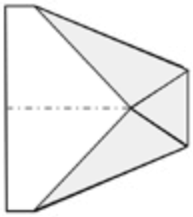
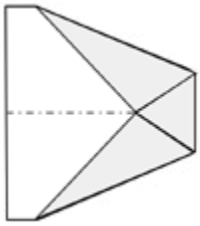
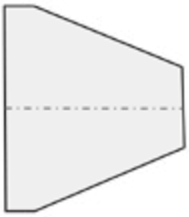
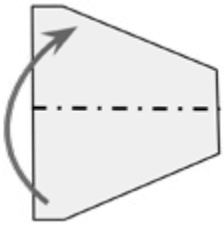
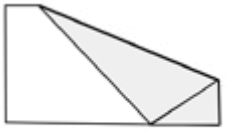
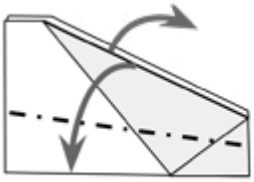
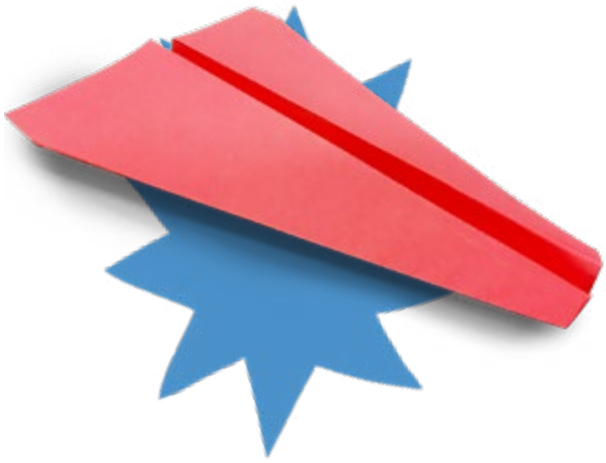
MODEL: ALPHA

Follow these steps to build this model paper airplane.



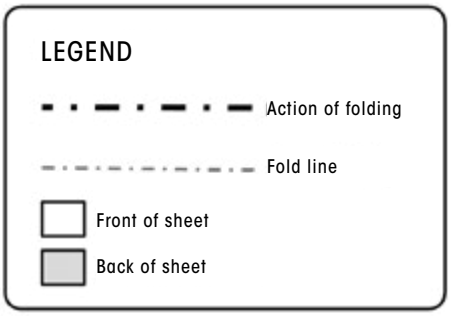
Steps	Action	→	Results
1		→	
2		→	
3		→	
4		→	
5		→	

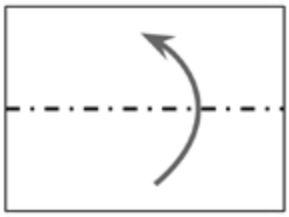
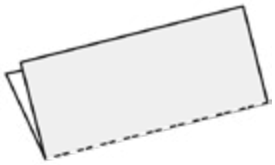
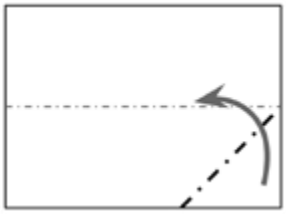
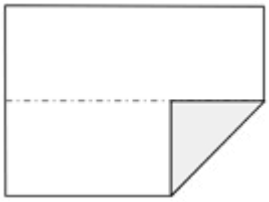
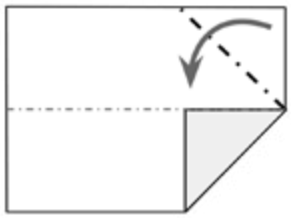
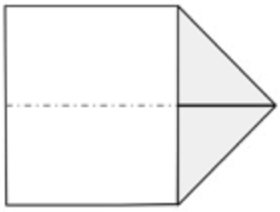
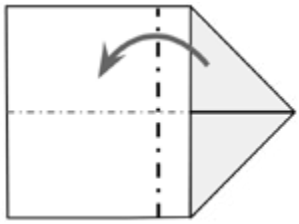
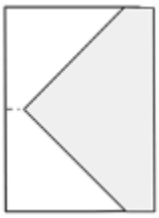
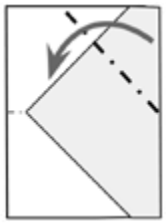
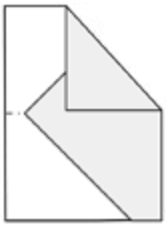
MODEL: ALPHA (CONTINUED)

Steps	Action	→	Results
6			
7		 Flip	
8			
9			

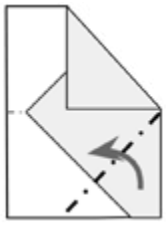
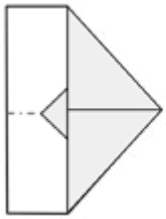
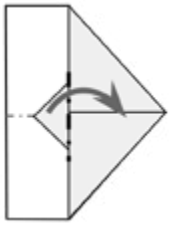
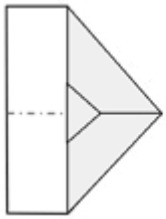
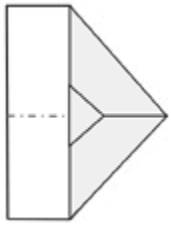
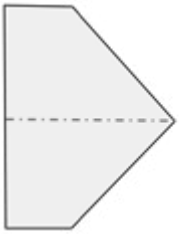
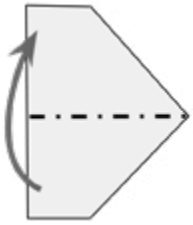
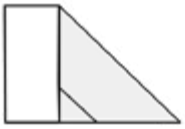
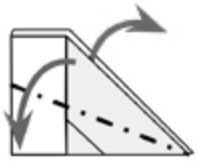
MODEL: BETA

Follow these steps to build this model paper airplane.



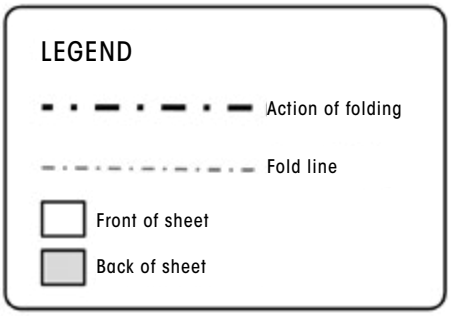
Steps	Action	→	Results
1		→	
2		→	
3		→	
4		→	
5		→	

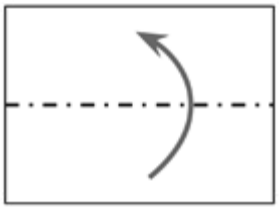
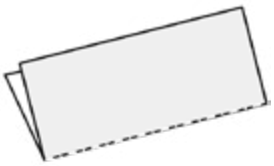
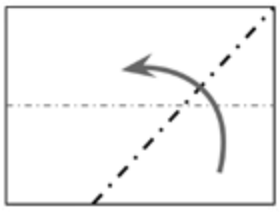
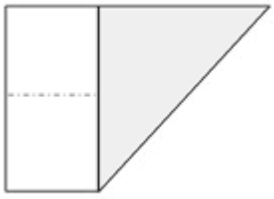
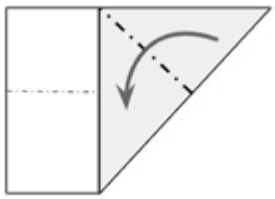
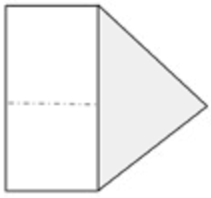
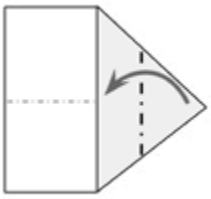
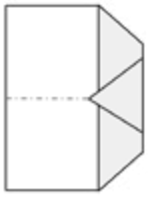
MODEL: BETA (CONTINUED)

Steps	Action	→	Results
6			
7			
8		 Flip	
9			
10			

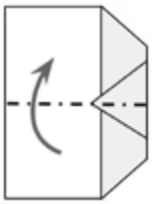
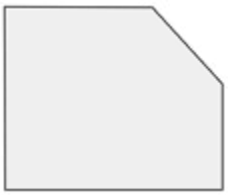
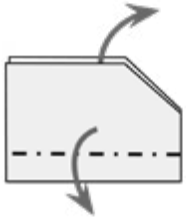
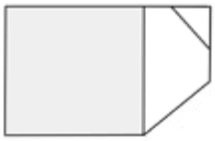
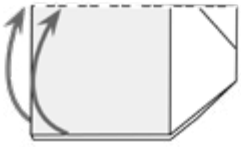
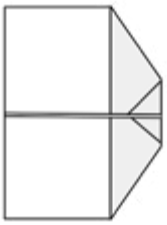
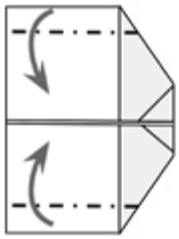
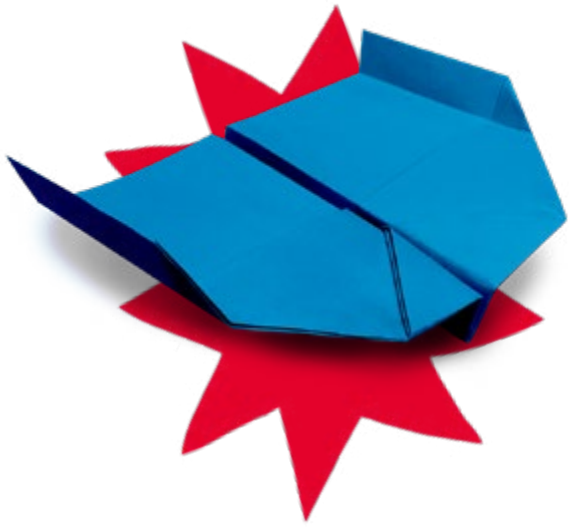
MODEL: GAMMA

Follow these steps to build this model paper airplane.



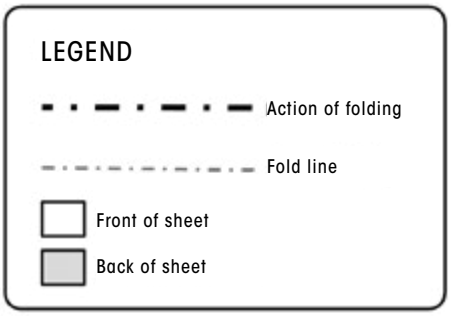
Steps	Action	→	Results
1		→	
2		→	
3		→	
4		→	

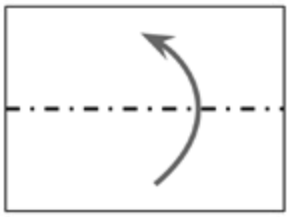
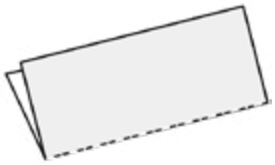
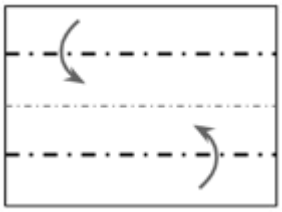
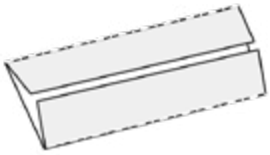
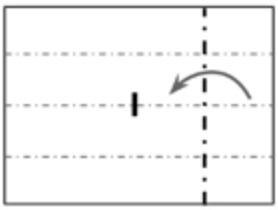
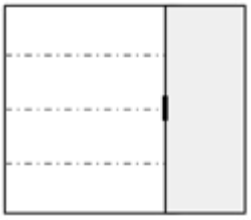
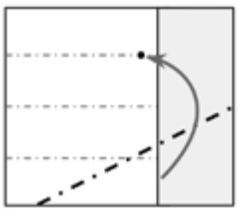
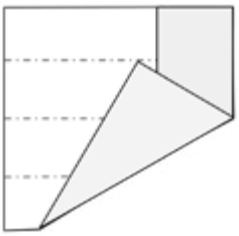
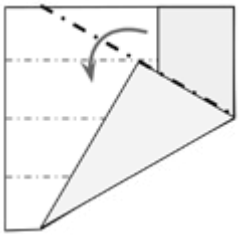
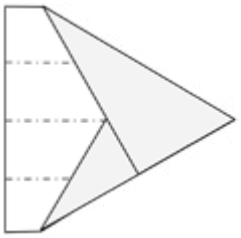
MODEL: GAMMA (CONTINUED)

Steps	Action	→	Results
5			
6			
7		 Unfold the Wings	
8			

MODEL: DELTA

Follow these steps to build this model paper airplane.



Steps	Action	→	Results
1		→	
2		→	
3		→	
4		→	
5		→	

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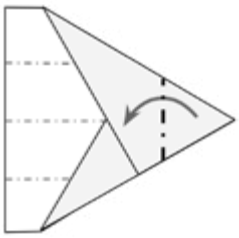
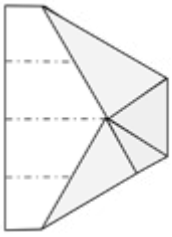
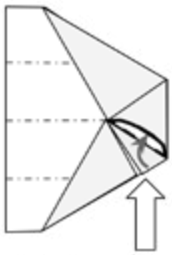
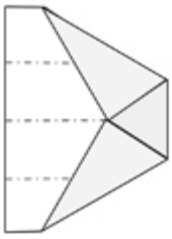
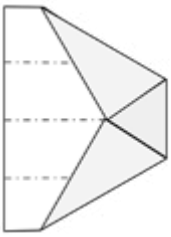
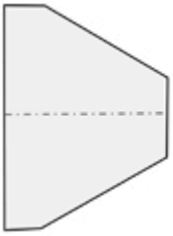
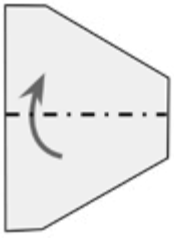
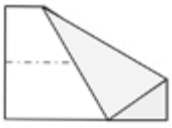
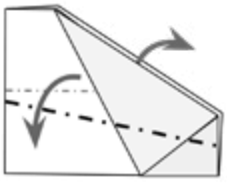
6		→	
7	 PLIER ET INSÉRER	→	
8		 Flip	
9		→	
10		→	

MODEL: EPSILON

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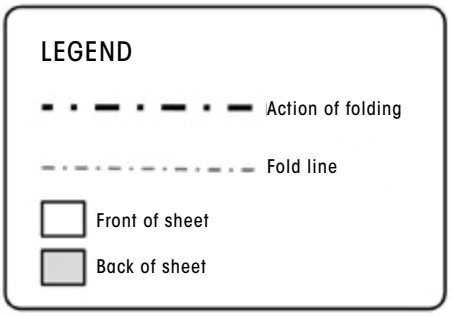
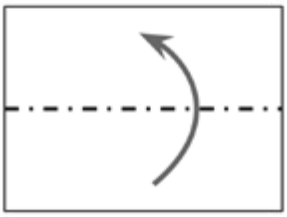
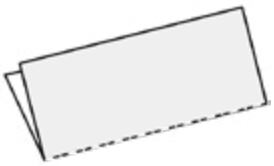
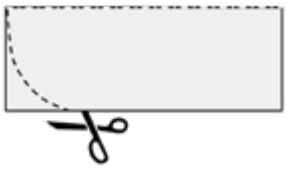
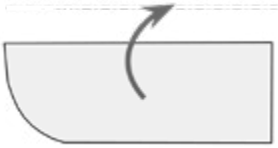
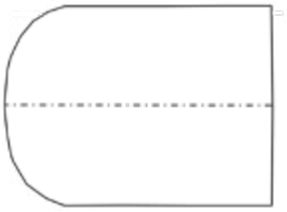
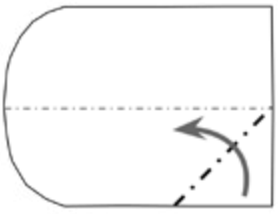
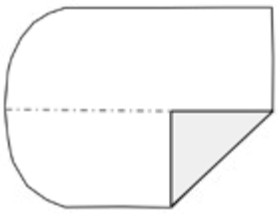
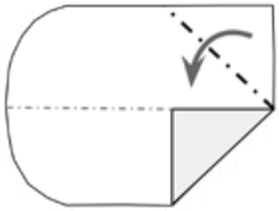
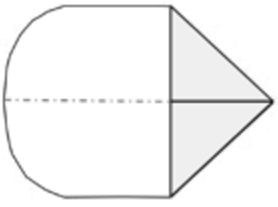
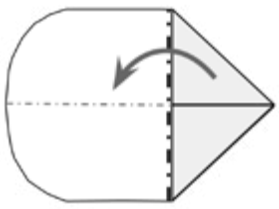
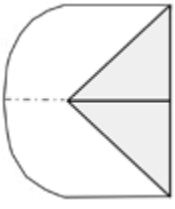
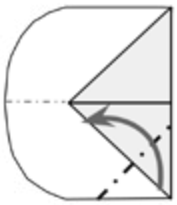
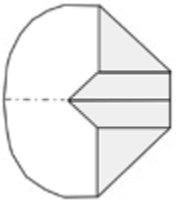
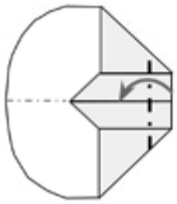
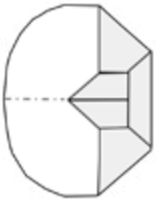
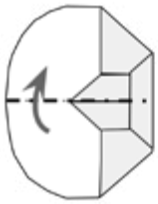


Steps	Action	→	Results
1		→	
2		→	
3		→	
4		→	
5		→	
6		→	

MODEL: EPSILON (CONTINUED)

Steps	Action	→	Results
7		→	
8		→	
9		→	
10		→	
			
11		→	

MODEL: ZETA

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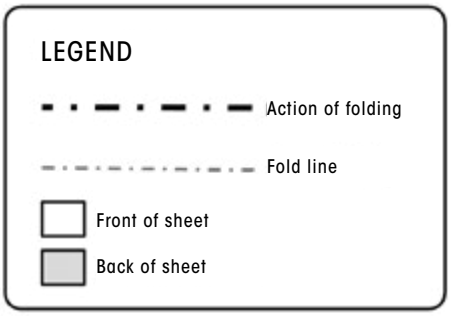
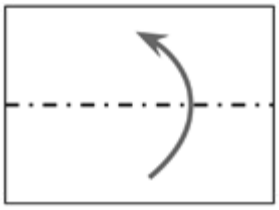
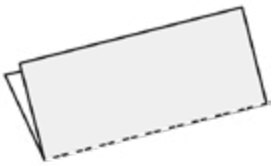
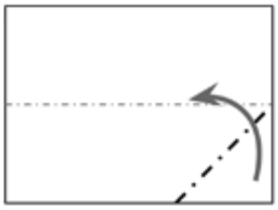
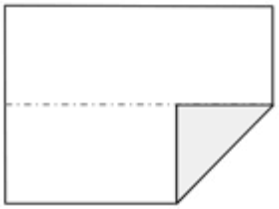
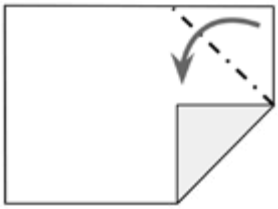
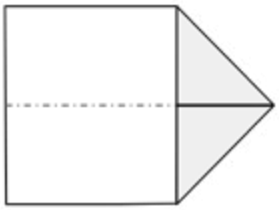
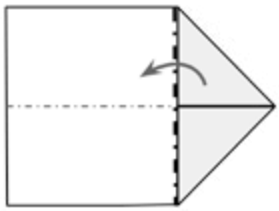
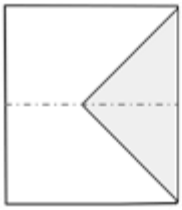
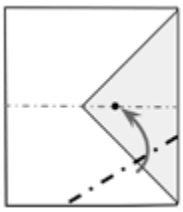
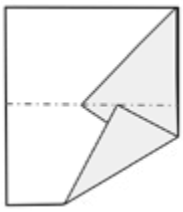
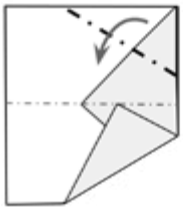
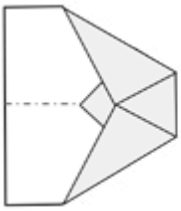
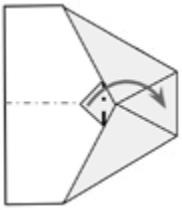
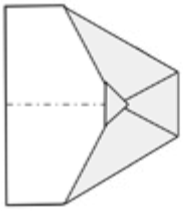
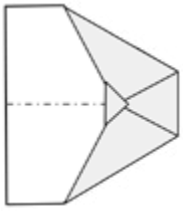
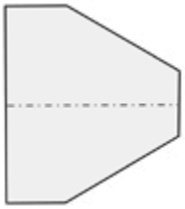
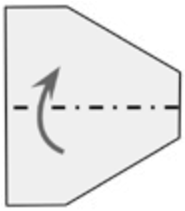
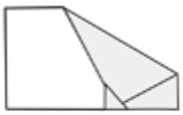
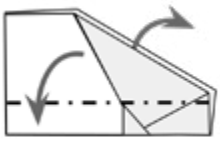


Steps	Action	→	Results
1		→	
2		→	
3		→	
4		→	
5		→	

MODEL: ZETA (CONTINUED)

Steps	Action	→	Results
7			
8			
9		 Flip	
10			
11			

APPENDIX 2: ESL EXTRAS

This section was created especially for those teaching English as a Second Language in an Intensive context. In it, you will find:

- Appendix 2A – General Suggestions
- Appendix 2B - Grammar Flash
- Appendix 2C - Cognates
- Appendix 2D - Idioms
- Appendix 2E - The Parts of an Airplane
- Appendix 2F - Some Functional Language
- Appendix 2G - C1 General Evaluation Tool
- Appendix 2H – Choiceboard
- Appendix 2I – Graphic Organizers
- Appendix 2J – The Writing Process
- Appendix 2K - C3 Generic Evaluation Tool

GENERAL SUGGESTIONS

APPENDIX 2A

Competency 1: To interact orally in English

Use the evaluation tool provided to observe students as they are planning their design and performing the various tasks.

Functional Language Posters:

Ask students to brainstorm other possible phrases they will need while planning their prototype.

Competency 3: To Write Texts

Students can write a procedure *(a step-by-step preparation)* for the competition that will help them to succeed at the challenge. They can choose to present it as a poster, infographic, checklist, etc.

Suggested Tools:

- Graphic Organizers
- *I Write Texts Checklist*

Reflection Questions

It is important that students reflect on their experience at every step of the LES -before, during and after the challenge. The following ideas will help students make a connection to the work they are doing, which will make it more meaningful to them.

BEFORE: Warm-Up Brainstorming Session

Before introducing the mission to students, present them with the problem and ask them if they have any ideas about how to solve it. See *Grammar Flash: What Could We Do To Help? (Appendix 2B)*.

DURING

Consider these questions in a group discussion, just **after a new concept** has been presented and explored by the students:

- Give examples of where in your life you have seen the concept(s) presented in this activity.
- How does this concept connect to your life? to the world?
- What did you learn from this activity?

AFTER

Consider these questions in a group discussion, **at the end of the challenge**:

- What was your favourite part of the challenge?
- What was the most difficult part of the challenge for you?
- How did you "fail forward" during the design and construction of the challenge?
- Name something you learned about teamwork while completing this challenge.

Journaling Ideas

- Ask students to record their daily experiences, in any form they choose *(collaborative platform, personal journal, video, audio...)* to reflect on their practices, and/or share with their classmates.
- Describe how knowledge of science concepts can be useful in everyday life.
- Give students the choice of answering ANY of the BEFORE, DURING or AFTER questions in their journal.

WHAT COULD WE DO TO HELP?

To be presented **BEFORE** students start the mission, after slide 2.

WHAT COULD WE DO TO HELP?
We use ***could*** to express possibility. Examples: *We could play baseball at recess.* *We could build a snowman in our backyard in winter.*
With your team, write 5 ideas that could help the messages get to their recipients.
1.
2.
3.
4.
5.

WHAT COULD WE DO TO HELP?
We use ***could*** to express possibility. Examples: *We could play baseball at recess.* *We could build a snowman in our backyard in winter.*
With your team, write 5 ideas that could help the messages get to their recipients.
1.
2.
3.
4.
5.

COGNATES: FRIEND OR FOE?

APPENDIX 2C

SETTING THE SCENE: The Carrier Pigeons Are Sick!

PART 1 - THE SAME

Read the description of the mission on page 2 of your Student Handbook, *The Carrier Pigeons Are Sick!*. With your teammates find all the words that are **the same** *(or similar)* in English and in French and write them in the table.

Ex.: mission					

PART 2 – COGNATES AND FALSE FRIENDS

COGNATE

A cognate is a word that is the same in English and French and has **the same meaning.**

FALSE FRIEND!

A false friend is a word that is the same in English and French but has **a different meaning.**

Read the paragraph again to help you decide which words are cognates and which are false friends. Circle the cognates and draw an X on the false friends.

REFLECTION

1. What is important to know about cognates and false friends?

_____

_____

2. Can you think of other examples of cognates and false friends?

_____

_____

ANSWER KEY - COGNATES: FRIEND OR FOE?

APPENDIX 2C

SETTING THE SCENE: The Carrier Pigeons Are Sick!

PART 1 - THE SAME

Read the description of the mission on page 2 of your Student Handbook, *The Carrier Pigeons Are Sick!*. With your teammates find all the words that are **the same** *(or similar)* in English and in French and write them in the table.

Ex.: mission	scene	pigeon	rest	absence	messages
transported	solution	construct	recipients	replace	capable
long	distances	Be precise	complete	rare	but
sure	a				

PART 2 – COGNATES AND FALSE FRIENDS

COGNATE

A cognate is a word that is the same in English and French and has **the same meaning.**

FALSE FRIEND!

A false friend is a word that is the same in English and French but has **a different meaning.**

Ex.: mission	scene	pigeon	~~rest~~	absence	messages
transported	solution	construct	recipients	replace	capable
long	distances	Be precise	complete	rare	~~but~~
sure	~~a~~				

REFLECTION

1. What is important to know about cognates and false friends?

Cognates help you understand a text, but false friends can sometimes confuse you.

2. Can you think of other examples of cognates and false friends?

Personal answer

IDIOMS

APPENDIX 2D

PART 1 - Match me!

In the description of the mission on page 2 of your Student Handbook, *The Carrier Pigeons Are Sick!* there are many idioms. What do you think they mean? Draw a line to the correct meaning. Can you find other idioms in the LES?

Make sure everything is **in order.**	To get better.
To **fall ill.**	To depend on someone.
To **step in.**	To become sick.
To **count on someone's help.**	To replace.
To make **a full recovery.**	To make sure all is ok.

Part 2: Fill in the blanks.

Complete the following sentences by using the correct idiom from above.

1. Before I go to school, I make sure everything in my schoolbag is _____ .

2. My teacher _____ so a substitute teacher _____ until she made _____.

3. My parents _____ to clear the table after supper.

PART 3: CHOOSE HOW YOU PRACTICE!

Create new sentences using these idioms OR write a short story using these idioms.

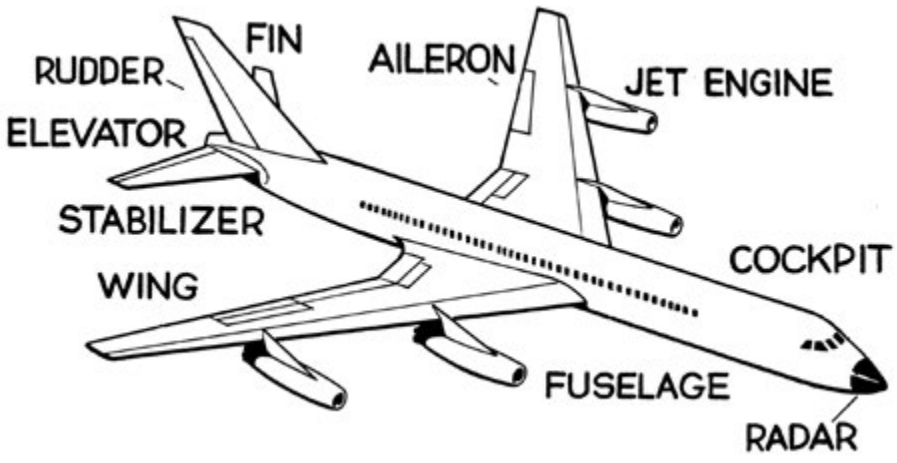
THE PARTS OF AN AIRPLANE

APPENDIX 2E

Video: Parts of airplane – Episode 1 - Aerospace

1. Look at the list of airplane parts in the table.
2. Make a checkmark besides the ones you know.
3. This video describes many parts of an airplane. Watch it and decide which three parts you think will be important for your paper airplane.

	AIRPLANE PART	IMPORTANT FOR PAPER AIRPLANE ?	USE
1	Fuselage		
2	Wings		
3	Winglet		
4	Cockpit		
5	Aileron		
6	Leading edge slats		
7	Flaps		
8	Spoilers		
9	Engine		
10	Rudder		
11	Horizontal stabilizer		
12	Vertical stabilizer		
13	Radom		
14	Elevator		



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SAMPLE FUNCTIONAL LANGUAGE

APPENDIX 2F

SAMPLE FUNCTIONAL LANGUAGE FOR ORAL INTERACTION IN, ALL ABOARD!

The following are a few examples of language that can support students while they are deciding which model airplanes to choose for their challenge. There is room for more!

- Which model do you think will work best?
- Which model will travel the furthest?
- Which model will reach the target?
- Which model can turn left and right?

- I think this model will be the best!
- I think this model will definitely fly the furthest.
- I think this model will always hit the target.
- I think this model will easily turn left and right?

- Hmm, I'm not sure. What do you think?
- This model always performed will in the tests.
- This model did not perform well.
- I agree!
- I Don't agree.

APPENDIX 2G

ELEMENTARY CYCLE THREE ESL GENERIC EVALUATION TOOL

Competency 1, *To interact orally in English*

Class: _____

Evaluation criteria: Participation in exchanges and Use of functional language				Student Names		
	Participation in exchanges	**20**	Speaks throughout, contributing substantial content, AND uses techniques to create true interaction (e.g. asks partner questions, reacts to and builds on partner's ideas).			
		16	Speaks throughout, contributing substantial content.			
		12	Speaks throughout, contributing limited content.			
		8	Speaks sporadically.			
		4	Speaks rarely.			
	Use of vocabulary and useful expressions	**15**	Quickly accesses a variety of vocabulary and expressions.			
		12	Uses a variety of vocabulary and expressions.			
		9	Uses basic vocabulary and expressions.			
		5	Lacks vocabulary.			
	Comprehension of messages by an anglophone	**15**	Messages are easily understood despite errors, if any.			
		12	Messages are understood with **some** interpretation.			
		9	Messages are understood with **considerable** interpretation.			
		6	**Some** messages are not understood despite interpretation.			
		3	Messages are understood; however, they are very brief, very simple and/or very few.			
			Total /50			
			Challenges (see list below)			

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Special cases

- ☐ If a student does not participate or does not speak in English, allot 0/50.
- ☐ If most or all messages cannot be understood, allot 15/50.

Challenges

1. Using English words
2. Pronouncing keywords clearly
3. Using a variety of words
4. Expressing more ideas
5. Elaborating on ideas (giving examples, details, etc.)
6. Expressing a personalized message
7. Asking questions to maintain interaction, ask for details, ask for clarification, etc.
8. Building on what partner says
9. Reacting to what partner says
10. Initiating an exchange
11. Using vocabulary from available resources
12. Using a specific language convention: _____
13. Using the strategy _____
14. _____

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Using the Evaluation Tool

This generic evaluation tool is suitable for most oral interaction tasks. It may be used with Elementary 5 or 6 students. Teachers may adjust the level of difficulty through task choice, design, requirements and expectations.

This tool was designed for two purposes:

1) to allow teachers to collect marks on students' oral interaction skills for the report card
2) to help teachers support student learning by providing specific feedback in the form of challenges

For each section of the tool, first determine which descriptor best represents each student's performance, and write the corresponding mark in the appropriate box. Add up the marks to obtain the final result for the task.

Next, determine which challenge(s) from the provided list, if any, each student should focus on to improve his or her oral interaction skills. Write the corresponding number(s) in the correct boxes.

Notes on the Descriptors

› *Participation in exchanges*

Throughout – The student is participating from beginning to end.

Sporadically – The student speaks at irregular intervals, creating long pauses or leaving most of the talking to his or her partner.

Rarely – The student is barely active in the discussion. Since the student has managed to express a minimal number of messages, the performance must be evaluated. Less participation than *Speaks rarely* means that the student is not speaking (see the *Special Cases* section).

Substantial content – The student expresses a fair or significant number of ideas and/or expresses in-depth ideas (e.g. elaborates, gives examples, explains).

Limited content – Ideas are few and/or of little depth. Limited content may be exhibited as one or more of the following:

- The student tends to repeat his or her own ideas or those of his or her partner.
- The student mostly expresses generic ideas that could apply to any task (e.g. *It is correct*; *It's a good idea*; *I agree*).
- Most of the student's statements are short, not detailed.

Techniques to create true interaction – The student uses techniques to initiate a conversation, to keep it going or to involve a partner. True interaction is demonstrated when a student asks a partner questions, reacts to something the partner has said, or expands on an idea expressed by the partner by, for example, adding to it, disagreeing with it, or taking it in a new direction. Basic turn-taking, without considering what the partner has previously said, is not true interaction.

› *Use of vocabulary and useful expressions*

Quickly – "Quickly accesses" denotes the speed and considerable ease with which the student retrieves most or all words and expressions from his or her personal language repertoire to express messages. Pauses that occur when reflecting, that are used to create an effect or to allow the partner to speak are considered to be natural pauses and are not penalized.

Variety of vocabulary and expressions – "Variety" refers to the range and precision of words and expressions used by the student to express messages.

Basic vocabulary and expressions – The student uses a minimum range of words and expressions, which are rarely precise. The student is able, nonetheless, to convey a message using the language he or she has acquired.

Lacks vocabulary – The student is often unable to retrieve the language he or she needs, failing to use synonyms or circumlocutions. The student's speech is characterized by missing words, French words or expressions, and/or long pauses during which the partner may jump in to help. The student who demonstrates a lack of vocabulary has difficulty expressing a message.

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› *Comprehension of message by an anglophone*

You must listen to students as if you were an anglophone with little or no knowledge of French.

Easily understood – You do not have to infer to understand the student's messages.

Despite errors, if any – Errors, if any, do not affect comprehension of the student's messages.

Some interpretation – You must infer to understand a few messages but most messages do not require interpretation.

Considerable interpretation – You must make a substantial effort to understand many of the student's messages.

Some messages are not understood despite interpretation – Even though you try to infer meaning, you do not always understand the student's messages, either in whole or in part.

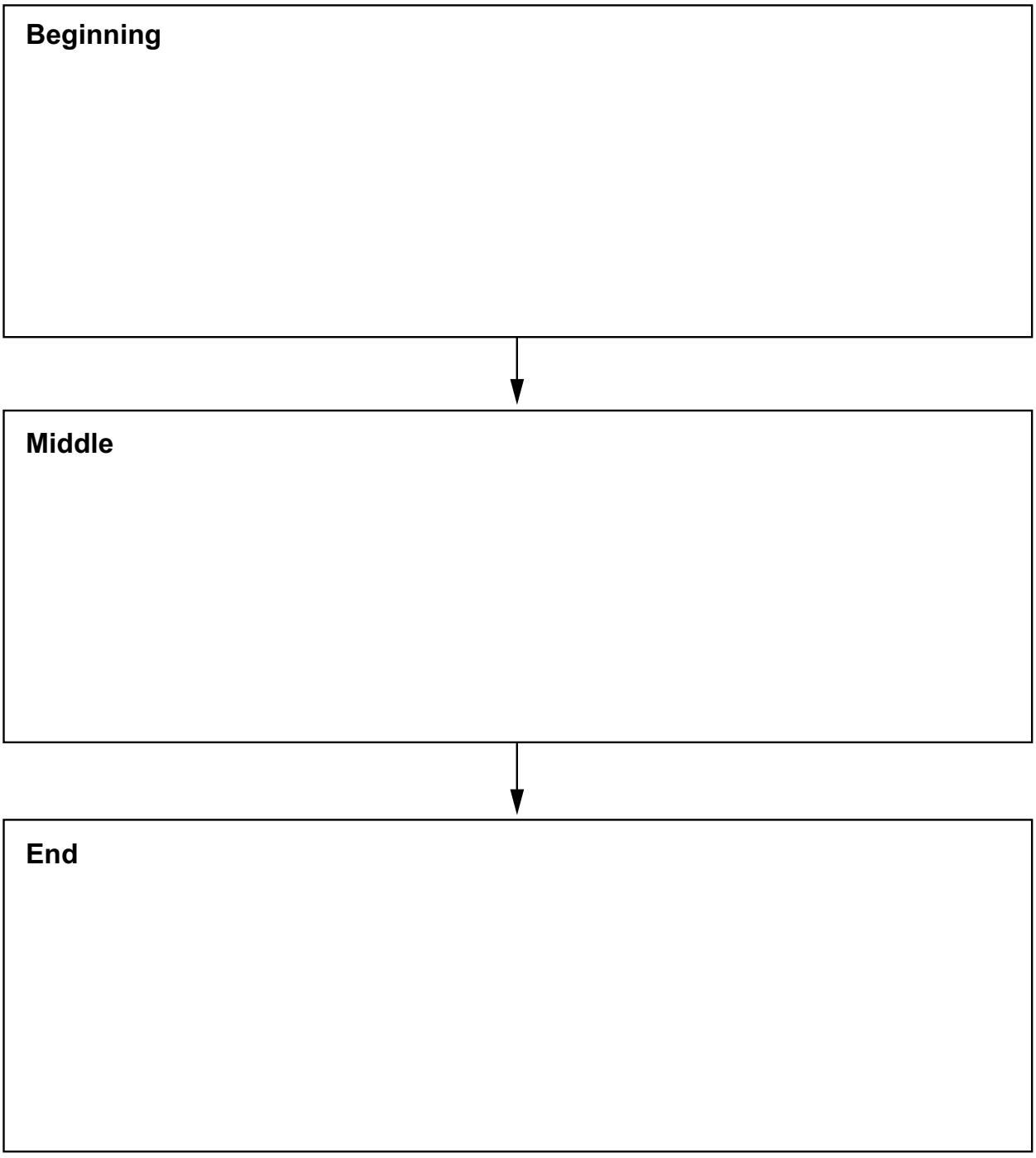
Messages are very brief, very simple or very few – When messages are very brief (one or two words), very simple (e.g. *It is good*) or very few, they can be understood but consist of too little language or content.

CHOICE BOARD Choose a video, choose an activity, and choose the way you will present it!			
VIDEOS	**PAPERMAN (6:34)** Kahrs, John, 2021, USA: Walt Disney Animation Studios https://www.dailymotion.com/video/xx6f6s	**APER PLANE (1:07)** Lorenzette, William 2010, InkyMind https://vimeo.com/12259794	**SOAR (6:14)** Tzue, Alyce, USA: Academy of Art https://vimeo.com/148198462
ACTIVITIES	Retell the story in your own words.	Create a story about one of the characters.	Describe the different ways that airplanes are used in these videos.
PRESENT IT!	Record it.	Write it.	Create a comic strip.

Students can use the following C3 planning graphic organizers.

Story Map 3

Write notes in each section.



Planning Chart

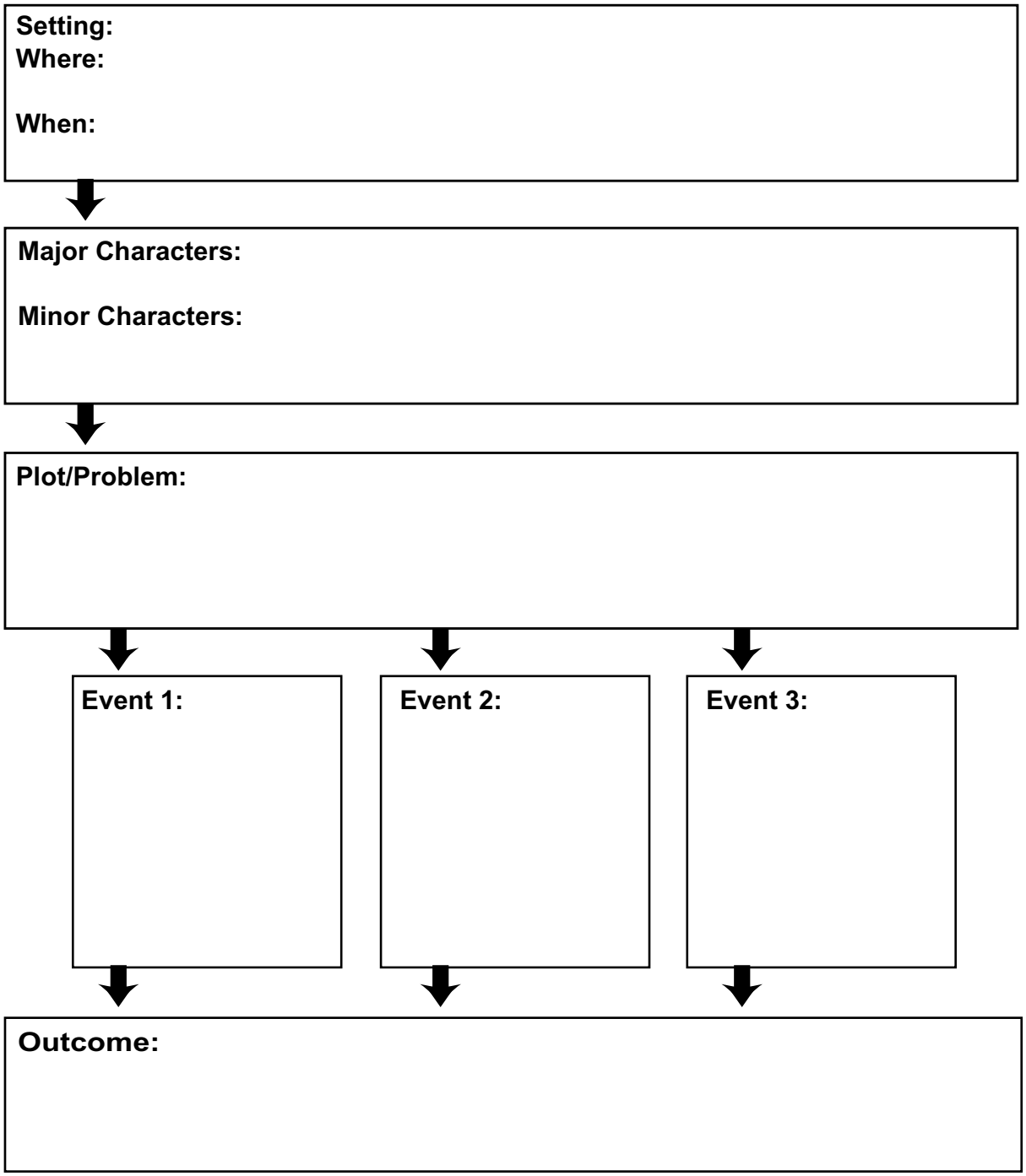
Circle or write your purpose for writing in the first column. Answer the questions in the second column.

Topic _____

Purpose	Audience
Circle one. ● to tell a real story ● to tell a made-up story ● to describe a person, place, or thing ● to explain how to do something ● to find something out ● to give an opinion ● to ask something ● other _____ _____ _____	*Write answers to these questions.* 1. Who will read this? _____ _____ _____ 2. What do they already know about my topic? _____ _____ _____ 3. What do I want them to know? _____ _____ _____ 4. What part of my topic would interest them most? _____ _____ _____

Story Map 2

Write notes in each section.



THE WRITING PROCESS

APPENDIX 2J

Prepare

- Refer to the instructions.
- Become familiar with the C3 evaluation tool.
- Activate prior knowledge.
- Brainstorm ideas with others.
- Note and organize your ideas in a planning tool.
- Research the topic, if necessary.
- Use resources, as needed.

Draft

- Refer to your planning tool.
- Set down ideas in complete sentences.
- Refer to written models and reference tools.
- Consult research, as needed.
- Ask for help, as needed.

Revise

- Reread the instructions.
- Determine if your ideas are clear, complete and well-structured.
- Refer to written models and reference tools.
- Request feedback from peers/teacher, as needed.
- Add, substitute, delete and rearrange words and ideas.

Edit

- Verify the grammar, punctuation and spelling targeted for the task.
- Refer to written models and reference tools.
- Request feedback from peers/teacher, as needed.
- Correct your errors.

Final copy

- Rewrite your revised draft to deliver a well-presented text.
- Share your final copy with the intended audience (optional).

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Elementary Cycle Three, Intensive ESL

The Writing Process

Elementary Cycle Three Generic[1] Evaluation Tool for Competency 3, *To write texts*

Name of student: _____ **Class:** _____

Evaluation criteria: Characteristics of the written text and Application of targeted language conventions

For marks and feedback purposes	For feedback purposes + = good job | – = to work on	
	Content	**Form**
› *Comprehension of the text by an anglophone* 10 The text is easily understood despite errors, if any. 8 The text is understood with **some** interpretation. 6 The text is understood with **considerable** interpretation. One or two sentences may not be understood. 4 Parts of the text are not understood despite interpretation.	+ – clarity + – detail + – flow + – paragraphing + – pertinence + – other: _____	+ – articles + – capitalization and/or punctuation + – prepositions + – pronouns / possessive adjectives / possessive forms + – sentence structure (e.g. word order) + – singular/plural + – spelling + – verbs (e.g. tense, agreement) + – vocabulary + – other: _____
› *Introduction or introductory sentence* 1 Effective 0 Ineffective 0 Missing	+ appropriate + catchy + original + useful + other: _____	– does not make sense – inappropriate or not pertinent to the task or context – incomplete – unclear – other: _____
› *Body of the text* 3 Effective 2 Mostly effective 1 Mostly ineffective 0 Ineffective	+ accurate + complete (all necessary information) + easy to follow + pertinent + well developed + well organized + other: _____	– essential information missing – inaccuracies – insufficient detail or development – lack of logic – lack of organization – poor paragraphing – repetition – some content that does not make sense, is confusing or is not understood – some content that is inappropriate or not pertinent to the task – task requirements missing – other: _____
› *Conclusion or closing* 1 Effective 0 Ineffective 0 Missing	+ appropriate + original + useful + other: _____	– does not make sense – inappropriate or not pertinent to the task or context – incomplete – repetitive – unclear – other: _____
› *Adaptation of the text to purpose and audience (task)* 5 Entirely 3 Mostly 1 Somewhat 0 Not at all	+ well-selected content + well-adapted content + well-selected language + other: _____	– some inappropriate content – some poorly adapted content – some inappropriate language – other: _____
Total mark for Competency 3	**/20**	

Main challenges

Special cases

If you are unable to fairly evaluate the text using the tool, select one of the following descriptors and allot 6/20.

- Most or all of the text cannot be understood, despite interpretation.
- The text is incomplete or too short.
- The text is off task.

[1] If this evaluation tool is used along with a Competency 2 tool, do not evaluate "Body of the text" or "Adaptation of the text to purpose and audience," in order to avoid an overlap in evaluation, as these two elements will be addressed in the Competency 2 tool.

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Using the Evaluation Tool

This generic evaluation tool is suitable for most writing tasks. It may be used with Elementary 5 or 6 students. You may adjust the level of difficulty through task choice, design, requirements and expectations.

This tool was designed for two purposes:

1) to allow teachers to collect marks on students' writing skills for the report card
2) to help teachers support student learning by providing specific feedback

The left-hand column is used to assess the texts and provide marks. In the right-hand column, you may provide specific feedback that will allow students to have a better idea of what they are doing well (+ sign) and what they still need to work on (– sign), and enable you to base your assessment on observable elements.

For each section of the evaluation tool, first determine which descriptor best represents the student's text, and circle the corresponding mark. Next, in the right-hand column, circle the elements that were particularly strong and those that were the most problematic. The goal is to identify which elements stood out and which should be tended to, not to catch each mistake or weakness. Finally, add up the marks in the left-hand column to obtain the final result for the task.

Notes on the Descriptors

› *Comprehension of the text by an anglophone*

You must read the text in its entirety as if you were an anglophone with little or no knowledge of French or the task.

Easily understood – You do not have to infer to understand the text.

Despite errors, if any – Errors, if any, do not affect the comprehension of the text.

Some interpretation – You must infer to understand parts of the text but most of the text requires no interpretation.

Considerable interpretation – You must make a substantial effort to understand several parts, or a significant portion of, the text.

Parts of the text are not understood despite interpretation – Even though you try to infer meaning, part of the text remains unclear.

› *Introduction or introductory sentence*

Depending on the form of text that students are required to write, the introduction may simply consist of an introductory sentence (e.g. *I'm writing to propose a new activity for the school* or *Once upon a time there lived a little girl*).

Do not use this section (and adjust the total marks) if:

- the text does not call for any introduction or introductory sentence (e.g. poster)
- students merely reproduce an introduction from a model provided to them

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› *Body of the text*

No matter what form of text students are required to write, the body of the text must meet certain requirements: the content must be relevant to the task and sufficiently developed; ideas must be clear and grouped in a logical manner so the reader can easily follow them; information must be accurate, etc. To determine the degree of effectiveness, refer to the task and the set requirements. Refer to the sidebar if the task involves Competency 2.

Note about integrated tasks

If the task that students carry out involves Competency 2, *To reinvest understanding of written and oral texts*, two sections of the tool will not be used in order to avoid an overlap in evaluation: "Body of the text" and "Purpose and audience." These sections will be addressed in the Competency 2 tool.

› *Conclusion or closing*

Depending on the form of text that students are required to write, the conclusion may simply consist of a brief sentence that appropriately brings the text to a close (e.g. *I hope this information will be useful* or *They lived happily ever after*).

Do not use this section (and adjust the total marks) if:

- the text does not call for any conclusion or closing (e.g. poster)
- students merely reproduce a conclusion or a closing from a model provided to them

› *Adaptation of the text to purpose and audience*

All texts are written for a purpose and a target audience. The purpose can be basic (e.g. to remind someone of an upcoming event) or more complex (e.g. to convince someone to do something). The target audience can be a single person, a group or the public at large.

You can determine whether or not a text was written in light of the purpose and audience by asking yourself a few questions. For example:

- Does the text accomplish what it was supposed to accomplish? For example, if the student was meant to explain a concept, was the concept explained well so that the reader will easily understand?
- Is the language used appropriate to the purpose and audience? For example, are words too technical for the target audience? Is slang used in a formal text?
- Is necessary background provided (if applicable)? For example, does the audience need to know certain facts about the topic to understand the text?
- Is there too much irrelevant or extraneous information, thus confusing the reader?
- Is information detailed enough for the audience to understand? For example, if a decision is presented in the text, is it explained? Are opinions supported?
- Is the information too specialized or technical for the reader, hindering his or her comprehension?
- Is the information organized in a way that the reader can easily follow and understand?

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