ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL ONE

INSTRUCTIONAL GUIDE

SECTION 3

EO M130.03 – CONSTRUCT A MODEL AIRPLANE

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-801/PG-001, *Proficiency Level One Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering this lesson.

Prepare a completed model airplane and collect model material and tools.

Photocopy Paper Model Assembly Instruction located at Attachment A and Attachment B, one for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An in-class activity was chosen for TP 1 as it is an interactive way to present the content and the construction of a model airplane.

A group discussion was chosen for TP 2 as it allows the cadets to interact with their peers and share their knowledge about building a model airplane.

INTRODUCTION

REVIEW

The review for this lesson is EO M130.02.

OBJECTIVES

By the end of this lesson the cadet shall have constructed a model airplane.

IMPORTANCE

Cadets have learned to identify the components of an airplane. This knowledge will be useful during familiarization flights, hangar visits, and other aviation activities. Being able to construct a model airplane provides cadets a method of confirming their knowledge of airplane components.

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Teaching point 1 **Construct a model airplane.**

Time: 45 min Method: In-Class Activity

ACTIVITY

Time: 30 min

OBJECTIVE

The objective of this activity is to have the cadets construct a model airplane.



The purpose of this model is to incorporate the major components as discussed in M130.02 – NOT to build a flying model. With the propeller and landing gear attached, this model will be too heavy to fly. The assembly time provided in this lesson does not allow sufficient drying time to produce an airworthy model. Aerodynamic features of assembly have been omitted for simplicity.

RESOURCES

- Paper model template (one per cadet),
- Instruction sheet located at Attachment A (one per cadet),
- Thumbtack (one per cadet),
- 1” binder clip (one per cadet),
- Scissors (one pair per cadet),
- Glue stick (one stick per two cadets), and
- Markers (to be shared by all cadets).

ACTIVITY LAYOUT

Nil.



Supervise the cadets’ work to ensure that they are following the instructions provided.

While supervising and assisting as needed, ask cadets to identify parts of the airplane.

Ensure cadets identify the leading and trailing edges of the wings and attach the wings facing the correct direction

Ask other instructors to assist in supervising the activity and assisting in answering questions.

ACTIVITY INSTRUCTIONS

1. Provide the cadets with the instructions sheet located at Attachment A.

2. Have the cadets cut out all the airplane pieces. Cadets must be careful not to mix their pieces with others around them.

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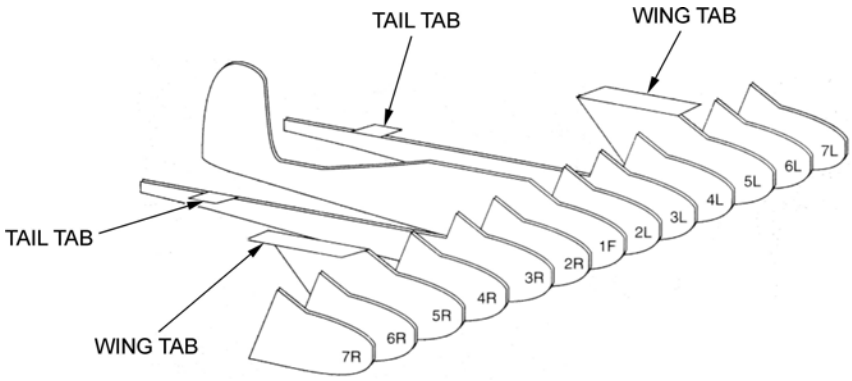
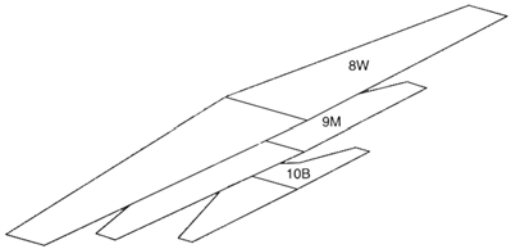
3. Have the cadets assemble the fuselage by gluing pieces 1F through 7R and 7L to build up fuselage layers, carefully aligning parts. Ensure that the entire contacting surface of a smaller piece being fastened to a larger one is completely covered with glue.



Adapted from Fabulous Paper Gliders

Figure 1 Fuselage Assembly

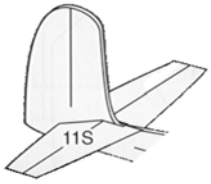
4. Have the cadets assemble the wings by gluing 9M to the bottom of wing part 8W. Glue 10B to the bottom of 9M making sure the wing parts are aligned along the centreline. Fold down the wing tabs on the fuselage, and apply glue to them. Fasten the wing assembly to the fuselage.



Adapted from Fabulous Paper Gliders

Figure 2 Wing Assembly

5. Have the cadets assemble the tail by folding down the tail tabs on the fuselage, and applying glue to them. Fasten the horizontal stabilizer 11S to the fuselage.



Adapted from Fabulous Paper Gliders

Figure 3 Tail Assembly

6. Have the cadets attach the propeller by piercing the centre of 12P with the thumbtack, and pushing the thumbtack into the centre of the fuselage assembly.

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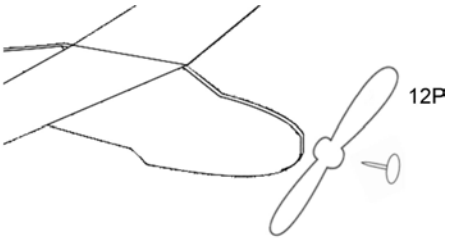
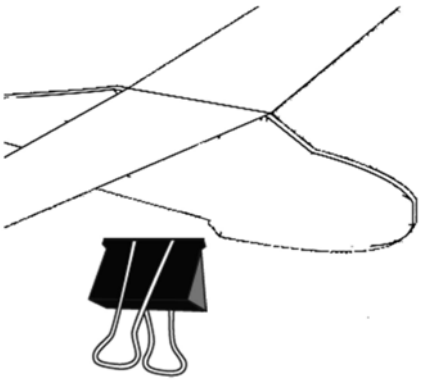


Adapted from Fabulous Paper Gliders

Figure 4 Propeller Assembly

7. Have the cadets attach the landing gear by clipping the binder clip to the bottom of the fuselage, underneath the wings.



Adapted from Fabulous Paper Gliders

Figure 5 Landing Gear Assembly

8. Have the cadets color the model as desired.

9. Have the cadets clean up, discarding all scrap paper and return materials.



Once the activity has been completed, examine the model airplanes to ensure that all of the components are assembled correctly.

SAFETY

Care should be taken when handling the thumbtacks, scissors, and glue.

INSTRUCTOR GUIDELINES

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the assembly of an airplane will serve as the confirmation of this TP.

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Teaching point 2 **Participate in a group discussion on parts of an airplane and constructing the model airplane.**

Time: 5 min Method: Group Discussion



TIPS FOR ANSWERING/FACILITATING DISCUSSION:

- Ask questions that help facilitate discussion; in other words, avoid questions with yes or no answers.
- Prepare questions ahead of time.
- Be flexible (you are not bound to only the prepared questions).
- Encourage cadets to participate by using praise such as “great idea” or “excellent response, can anyone add to that?”.
- Try to involve everyone by directing questions to non-participants.

SUGGESTED QUESTIONS:

Q1. What did you learn about airplane parts from this activity?

Q2. How did this activity help you understand airplanes better?

CONFIRMATION OF TEACHING POINT 2

The cadets' participation in the group discussion will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION



Review the components of an airplane with the following questions, using the model created by the cadets as a training aid. Point out the various components of an airplane discussed in the previous class.

SUGGESTED QUESTIONS:

Q1. What is the purpose of the landing gear?

Q2. Where are the ailerons located?

Q3. What movement does the rudder produce?

SUGGESTED ANSWERS:

A1. The landing gear supports the aircraft when it is on the ground and absorbs the shock of landing.

A2. Ailerons are hinged to the trailing edge of each wing, close to the wingtip. .

A3. The rudder controls the movement called yaw. Yaw is the side-to-side movement of the aircraft.

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CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Model building is an excellent opportunity to apply theoretical knowledge. Being able to identify and describe the main components of an airplane allows the cadets to more actively participate aviation activities.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A3-001 A-CR-CCP-263/PT-001 *From the Ground Up: Millennium Edition* (2000). Ottawa, ON: Aviation Publishers Co. Limited.

C3-017 ISBN 1-895569-23-0 Schmidt, N. (1998). *Fabulous Paper Gliders*. Sterling Publishing: New York, NY.

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PAPER MODEL ASSEMBLY INSTRUCTIONS

1. Cut out all the airplane pieces. Be careful not to mix your pieces with others.

2. Glue pieces 1F through 7R and 7L to build up fuselage layers, carefully aligning parts. Ensure that the entire contacting surface of a smaller piece being fastened to a larger one is completely covered with glue.

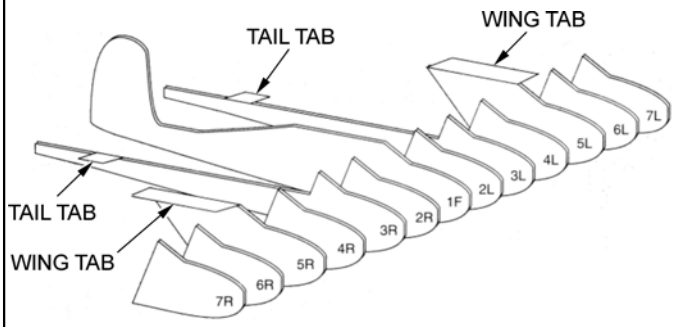

Figure A-1 Fuselage Assembly

3. To assemble the wings, glue 9M to the bottom of wing part 8W. Then glue 10B to the bottom of 9M. Make sure the wing parts are aligned along the centreline. Fold down the wing tabs on the fuselage, and apply glue to them. Fasten the wing assembly to the fuselage.

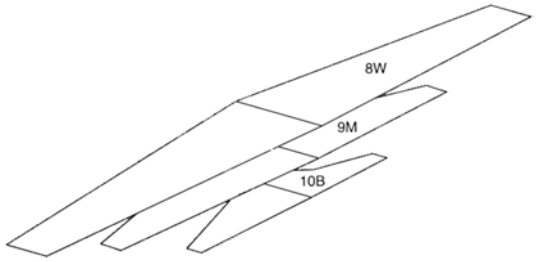

Figure A-2 Wing Assembly

4. To assemble the tail, fold down the tail tabs on the fuselage, and apply glue to them. Fasten the horizontal stabilizer 11S to the fuselage.

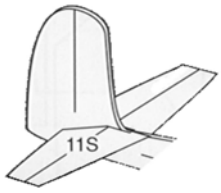

Figure A-3 Tail Assembly

5. To attach the propeller, pierce the centre of 12P with the thumbtack, and push the thumbtack into the centre of the fuselage assembly.

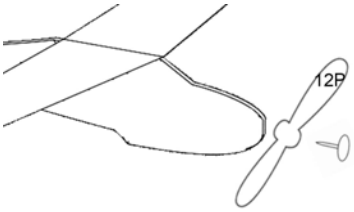

Figure A-4 Propeller Assembly

6. To attach the landing gear, clip the binder clip to the bottom of the fuselage, underneath the wings.

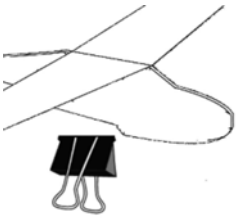

Figure A-5 Landing Gear Assembly

7. Color the model as desired.

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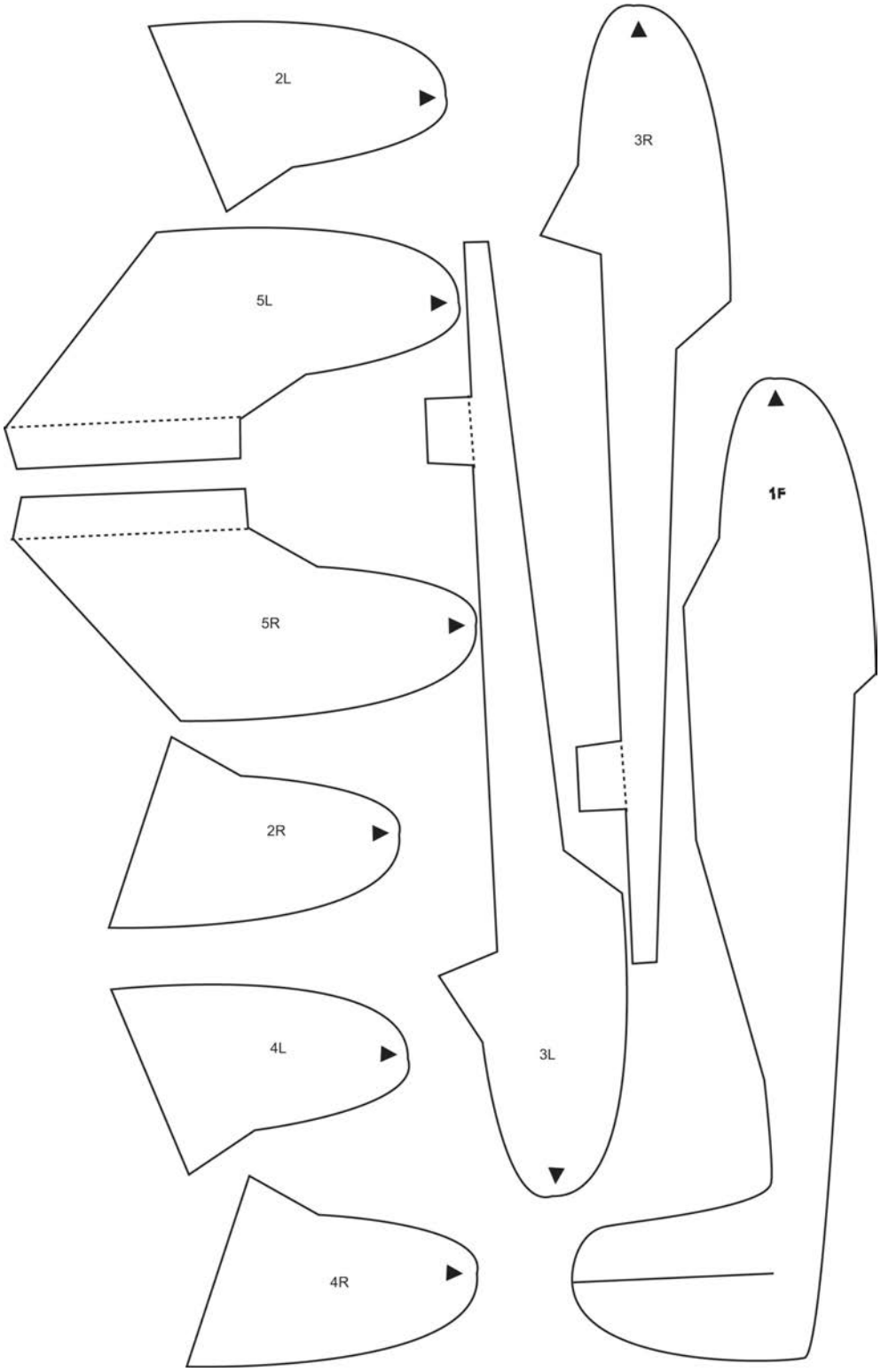

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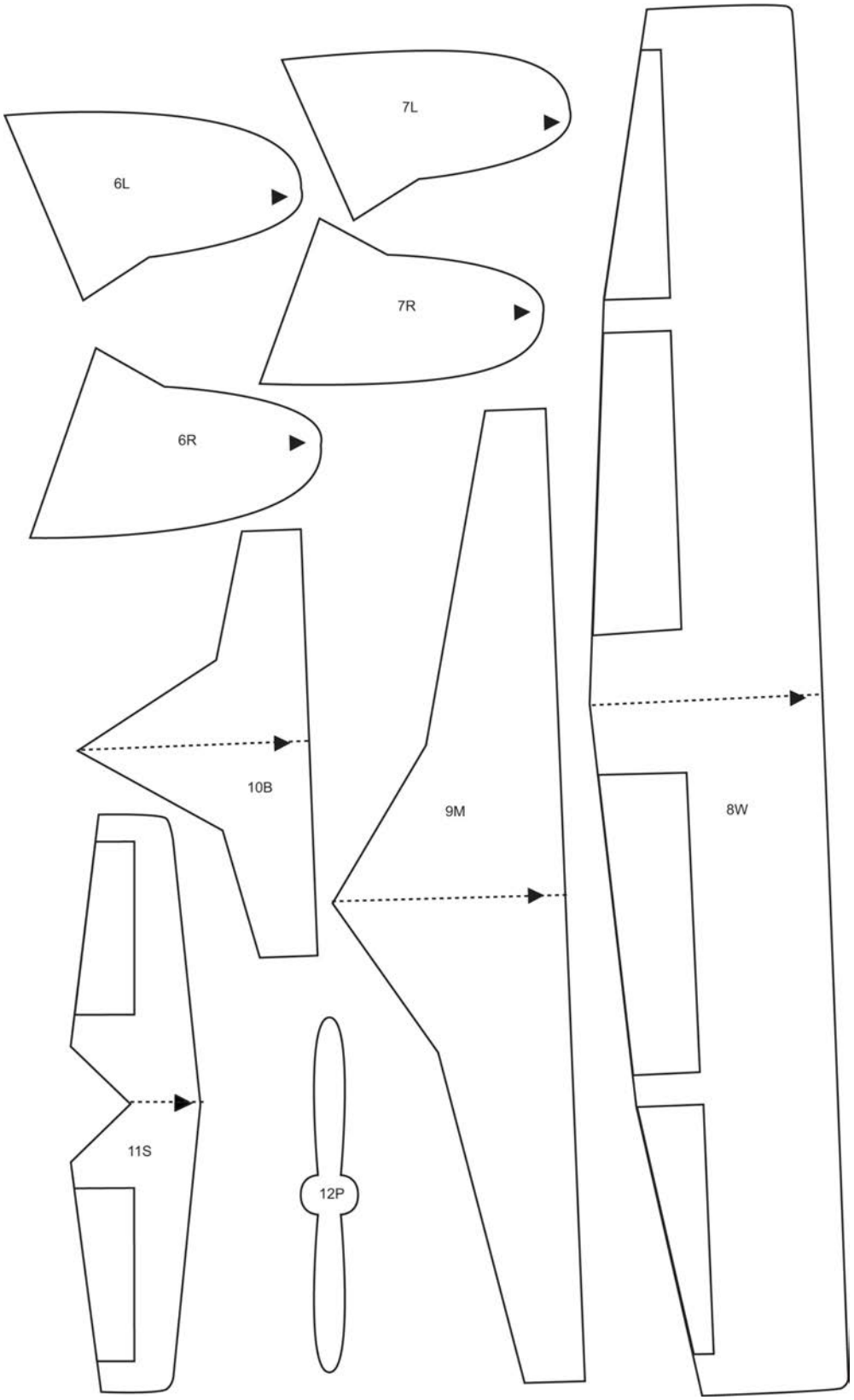

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