EO C440.04 – APPLY THE MATERIAL SCIENCE OF TRUSSES

1. **Performance**: Apply the Material Science of Trusses
2. **Conditions**:
   a. Given:
      (1) Legal-size graph paper,
      (2) Mechanical pencils,
      (3) Eraser,
      (4) 30-cm ruler,
      (5) Plastic protractor,
      (6) Marbles,
      (7) Suspended container mount,
      (8) Hot glue gun,
      (9) Hot glue sticks,
      (10) Hobby knife,
      (11) Uncooked spaghetti,
      (12) Supervision, and
      (13) Assistance as required.
   b. Denied: Nil.
   c. Environmental: Classroom or training area large enough to accommodate the entire group.
3. **Standard**: The cadet, in pairs, shall apply the material science of trusses by:
   a. designing a truss;
   b. constructing a truss; and
   c. testing a truss.
4. **Teaching Points**:

TP	Description	Method	Time	Refs
TP1	Explain the material science of trusses.	Interactive Lecture	15 min	C3-331
TP2	Have the cadets, in pairs, design a truss.	Practical Activity	15 min	
TP3	Have the cadets, in pairs, construct and test a truss.	Practical Activity	50 min	

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5. **Time**:

a.	Introduction / Conclusion:	10 min
b.	Interactive Lecture:	15 min
c.	Practical Activity:	65 min
d.	Total:	90 min

6. **Substantiation**:

   a. An interactive lecture was chosen for TP 1 to generate interest in the material science of trusses and summarize the teaching point.

   b. A practical activity was chosen for TPs 2 and 3 as it is an interactive way to allow the cadets to design and test a truss in a safe and controlled environment.

7. **References**: C3-331 McMaster University YES I Can! Science Team. (2009). *How forces act on structures*. Retrieved February 19, 2009, from http://resources.yesican-science.ca/sts115/aboutforces.html

8. **Training Aids**:

   a. Presentation aids (eg, whiteboard / flip chart / OHP / multimedia projector) appropriate for the classroom / training area.

   b. Marbles, and

   c. Suspended container.

9. **Learning Aids**:

   a. Legal-size graph paper,

   b. Mechanical pencils,

   c. Eraser,

   d. 30-cm ruler,

   e. Plastic protractor,

   f. Marbles,

   g. Suspended container mount,

   h. Hot glue gun,

   i. Hot glue sticks,

   j. Hobby knife, and

   k. Uncooked spaghetti.

10. **Test Details**: Nil.

11. **Remarks**:

   a. This lesson should be taught in three consecutive periods.

   b. Cadets who are qualified Advanced Aerospace may assist with this instruction.

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