



Academic Activity Chapter 7

A Civil Engineering Project

Civil engineers design systems and structures that we use in our daily life. You have been contracted to research, budget, design, and model a birdhouse.

Research:

A civil engineer needs to take into consideration many factors when starting a project, such as the environment and environmental impacts and the materials. Go online to research the following factors.

- 1. Needs of the client.** To build a birdhouse that will suit a bird you will need to research a species of bird that nests in your area. If you do not know what type of birds live in your area take a digital picture of one you see in your neighborhood and run an online image search or look at a bird identification guide in your school library. Find and record the answers to the following questions.
 - a.** What is the species of bird? _____
 - b.** What is the size of the bird? _____
 - c.** At what time of year does it nest in your area? _____
 - d.** In what type of habitat does it nest? _____

- 2. Once your client research is done, the environmental considerations need to be factored in.**
 - a.** Where would you have to put the birdhouse in order for it to be used by the species of bird you have chosen? _____
 - b.** What is the yearly environment of your area? _____

- 3. The final bit of research is the materials.** You may find the online shopping section of a hardware or lumber store in your area to be the best resource for the following questions.
 - a.** What type of material is best suited for the job? Why? _____

 - b.** How much does it cost per unit? _____
 - c.** How are you going to fasten the pieces together? _____
 - d.** How are you going to mount or hang your birdhouse? _____
 - e.** How much will the mount or hanger cost? _____



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Budget:

4. List the materials you have chosen and their price per unit.

5. What will the total cost of the birdhouse be? _____

Design:

Using a technique from chapter three, use graph or engineering paper and a straight edge to draw a preliminary design of your birdhouse. Include walls and a floor, any beams for attachment or support of the walls, roof trusses, roof, door, all attachments, perches, and mounting poles or hangers. List the materials as you draw and update your budget if you include something you didn't account for initially. Remember to set a scale and keep all components to scale.



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Model:

When you have completed your research, budget, and design, you will need a full-scale model of your birdhouse. When you are creating your model, make sure to model every piece exactly as you drew it in the design. If a piece will not work as designed, update the drawing and any budget changes that it might cause. Coherence to your design is the most important factor in your model.

Choose a material to model and a method of attachment as close as possible to the method of attachment in your design.

Material suggestions:

Foam board, cardboard (recycled would be best), card stock, poster board, manila folder, balsa, bass, or recycled wood, glue, and string or rope if hanging.