

# ARROW OF LIGHT MODULAR DESIGN ADVENTURE

## RATIONALE FOR ADVENTURE

This preview adventure gives Arrow of Light Scouts (5th grade) the opportunity to learn the concept of modular design and construction. Learning about modular construction is one way to be thrifty with resources. The adventure will include use of modular-based building pieces to design and construct. The popularity of this adventure will determine if it will become a standard elective adventure.

This adventure should be completed in one den meeting.

## TAKEAWAYS FOR CUB SCOUTS

- Understand the modular means for design or construction using pieces that interlock and/or are interchangeable with each other
- Develop communication skills to be able to follow and write instructions
- Explore creative engineering for fictional or real-life scenarios

## ADVENTURE REQUIREMENTS

Complete the following requirements.

1. Learn what modular design is and identify three things that use modular design in their construction.
2. Identify three benefits to using modular design.
3. Using modular-based building pieces, build a model from a set of instructions.
4. Using modular-based building pieces, build a model without a set of instructions. The model may represent something real or fictional.
5. Using the model you made in requirement 4, create a set of step-by-step instructions on how to build your model. Have someone build your model using your instructions.
6. Share your model with your den and/or family. Explain what your model is designed to do.
7. Without building it, design a model that uses modular-based building pieces. Create a set of step-by-step instructions.
8. With your parent or legal guardian's permission, watch a video demonstrating how something was built using modular design.



## NOTES TO DEN LEADER

Preview adventures will count as an elective adventure for Cub Scouts. During the preview period for the adventure, requirements, den meeting plans, and other resources to deliver the program can be found at [www.scouting.org/programs/cub-scouts/preview-adventures](http://www.scouting.org/programs/cub-scouts/preview-adventures).

When the adventure is completed, record it in ScoutBook. ScoutBook will be used to evaluate the success of a preview adventure and will assist in determining its viability.

**NEW!** This preview adventure is allowing us to explore different methods of instant recognition. **This adventure does not have an adventure loop or pin associated with it.** Instead, a downloadable certificate is available at [www.scouting.org/programs/cub-scouts/preview-adventures/modular-design/](http://www.scouting.org/programs/cub-scouts/preview-adventures/modular-design/).

Your feedback is necessary to help us evaluate and make improvements. Requirements and den meeting plans for preview adventures might change based on feedback. After your den has completed this adventure, please share any thoughts with us at [PreviewAdventures@scouting.org](mailto:PreviewAdventures@scouting.org). Let us know what you liked, what you did not like, what worked with the youth, what you would like to see added, or other thoughts you would like to share about the adventure.

These den meeting plans have Cub Scouts build a spaceship, however, other vehicles or objects may be used. Read through the entire adventure before beginning; it is important that all Cub Scouts are building the same type of object.

# MEETING 1 PLAN

## PREPARATION AND MATERIALS NEEDED

- U.S. and den flags
- A set of modular-based building pieces, enough for each Cub Scout to build with instructions
- Smartphone or device connected to the internet
- Random craft items that are not modular (for gathering activity). Use Popsicle sticks, clothespins, paper clips, tape, plastic bottles, etc.
- Sheets of white 8½ x 11 paper
- Crayons, markers, pens, or pencils
- Modular-based building blocks

## GATHERING

- Prepare a craft table with the random craft items. As Cub Scouts arrive, ask them to build a spaceship using only the items provided at the table. Give each Cub Scout at least 10 minutes to build a spaceship. Ensure Cub Scouts that they can take their spaceships home to finish them if they want to.



## OPENING

Conduct a flag ceremony of your choosing that includes the Pledge of Allegiance and the Scout Oath and Scout Law.

## TALK TIME (Requirements 1 and 2)

- Introduce the adventure to the den. Build interest by describing the goals of the adventure and some of the activities that are planned.
- Carry out business items for the den.
- Ask Cub Scouts what challenges they had with building their spaceship. (Look for answers about connecting different types of pieces to each other)
- Ask Cub Scouts: If you had to take a piece of someone else's spaceship, like a wing or engine, and put it on your own spaceship, how would you take it off without damaging it? How would you attach it to your ship?
- Could you take any piece of anyone's spaceship and easily attach it to yours?
- Share with Cub Scouts that modular design is when something is built using pieces that can be easily connected to one another and used to build more than just one thing.

## ACTIVITIES

### ◆ Activity 1: Modular Building (Requirement 3)

- With the use of modular-based building pieces with instructions, have Cub Scouts build a spaceship. Make sure there are instructions to follow to make the spaceship. Each Cub Scout may have a different type of spaceship; it is the use of instructions that is important to this adventure.
- After the Cub Scouts have completed their build, ask them to compare the building of a spaceship with random pieces without instructions (done during the gathering activity) compared to what they just completed.

### ◆ Activity 2: Modular Design (Requirements 4 and 6)

- With the use of modular-based building pieces used in Activity 1, have the Cub Scouts take apart their spaceships and now build a completely different spaceship using no instructions only their imagination. Tell the Cub Scouts to keep their builds simple as they will be making a set of instructions on how to build their ship in the next activity.
  - **Den Leader Tip:** If conducting an in-person den meeting, have the Cub Scouts take apart their spaceships and put all the pieces in one pile, giving everyone access to all the pieces and allowing for more creative options.
- Make sure Cub Scouts keep their spaceships together as they will need them to complete the next activity.
- Have each Cub Scout describe their spaceship and what special features it has. They may choose to build a story behind their ship and/or pilot.



### ◆ Activity 3: Modular Design and Building (Requirement 5)

- Using the spaceship the Cub Scouts built in Activity 2, give each Cub Scout a piece of paper and something to write with. Have them create step-by-step instructions on how to build their ship. They may either write, draw, or use a combination of writing and drawing.
  - o **Den Leader Tip:** Before doing this activity, watch the video on How to Build a Peanut Butter Sandwich to understand the challenges your Cub Scouts may encounter with creating instructions. You may choose to have your Cub Scouts watch it, too, before they begin to help them understand how to be clear with instructions. <https://youtu.be/Ct-IOOUqmyY>
- Have each Cub Scout give their instructions to someone else along with the needed pieces to build their spaceship, and have that other person build their spaceship.

### ◆ Activity 4a: Modular Design and Building (Requirement 8)

- Choose one of the following videos to watch.
  - o What is Modular Construction by National Fire Protection Agency <https://youtu.be/pvalrs1rTyU>
  - o Modular Construction at University of Michigan <https://youtu.be/Ko3qqATDa5Y>
  - o How To Build A Cruise Ship | How To Build Everything by The Discovery Channel <https://youtu.be/41wstAU8Nv8>
  - o Toulouse – Modular furniture design – BoConcept <https://youtu.be/Xgl42R0zKB4>

### ◆ Activity 4b: Modular Design (Requirement 7)

- Have each Cub Scout design a new spaceship using modular-based building pieces and write instructions on how to build the new spaceship. In this requirement, Cub Scouts do not actually have to build the spaceship; they only have to design one and create instruction on how to build it. The instructions must have a minimum of 10 steps to complete the design.

## CLOSING

Have Cub Scouts form a circle. Each Cub Scout places their right hand in the middle of the circle, and together they pump their hand up and down at the same time and say, “Do Your Best!”

## AFTER THE MEETING

- Serve refreshments, if desired.
- If Cub Scouts are keeping their spaceship, inform parents that their child has it.
- Record completion of requirements 1, 2, 3, 4, 5, 6, 7, and 8.
- Work together to clean up the meeting place.

