

# M.A.R.S. Mars Aerial Reconnaissance Simulation



## FAMILY INVOLVEMENT ACTIVITY

### Instructions for the Adult

Your child is busy preparing to run a live mission with NASA. This is one of the preparatory activities to teach your child some communications skills. No special math or computer skills are necessary. Your main job will be to work alongside your child, encouraging him or her, and helping the child to pay attention to the written directions.

All mission activities are guided by sets of written directions. Each team has step-by-step instructions on how to successfully complete its mission assignment. Encourage your students to thoroughly read. Upon completion of each step on their cards, they need to immediately move to the next step. The mission will operate smoothly if the students are encouraged to be self-starters and are motivated to move from one task to the next.

### Objectives

- Using task cards, students will communicate and follow directions with a partner to create a paper airplane.
- The students will practice using clear and concise directions.

### Materials

- Scissors
- Paper clip
- Mars control task cards
- Spacecraft task cards (**Cut them apart and put them in order.**)
- Paper airplane pattern (master found in the back of this guide)

When making copies of the paper airplane pattern, it is essential that the lines on the front and back of the paper line up where appropriate.

You may want to have additional copies of the airplane pattern available for students if they make a mistake or need to repeat the activity.

### Procedure

Find a large area to do this activity.

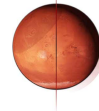
1. Decide who will begin with Mars control task cards and which team member will use the spacecraft task cards. The person using the spacecraft task cards should have the airplane pattern, scissors and paper clip.
2. Sit back to back for this activity so as not to see what your partner is doing. Halfway through you will switch places.

### Conclusions/Extensions

Have students create their own task cards. Using LEGOS™, or gumdrops and toothpicks, one person can design a “space probe” and write directions for how it was made. Then he or she can transmit the directions for how to build the space probe to you. Then compare the two models. Were you able to build the space probe correctly? How could you improve the directions?

## AIRPLANE TASK CARDS

### Mars Control - 1



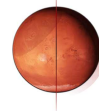
#### Preparing for Airplane Construction

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- A. Your job as Mars controller is to ensure that the paper airplane is constructed correctly.
- B. You will be in constant contact with your partner in the spacecraft.
- C. Your partner will begin the construction of the airplane. Halfway through construction, you and your partner will change positions and roles, and you will finish the construction.
- D. When you "send" a message to your teammate, please use the proper procedures. Say only what is given in this manual.
- E. Send a message to your teammate (verbally ask). You should say,  
**Spacecraft, this is Mars control.**  
**Do you have the airplane pattern, paper clip, and scissors? Are you ready to begin?**  
**OVER.**
- F. When your partner tells you he/she is ready to begin...

**GO TO THE NEXT TASK CARD**

### Mars Control - 2



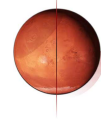
#### Constructing the Nose Section

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- A. Send the following message to your teammate. You should say,  
**Spacecraft, this is Mars control.**  
**We will now construct the nose section of the airplane. Lay the pattern down so that the side with the 'A' faces up and is at the top. The 'A' should remain at the top throughout construction.**  
**OVER.**
- B. You may be asked to repeat directions. Do so as requested, then wait until your teammate tells you that he or she is ready to proceed before moving to the next step.
- C. Send a message to your teammate. You should say,  
**Spacecraft, this is Mars control.**  
**Fold the pattern up along the lines 1 and 2 so that the edges C and D touch line 4. OVER.**

**GO TO THE NEXT TASK CARD**

## Mars Control - 3



### Constructing the Nose Section (cont.)

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- D. When your teammate is ready to proceed, send the following message. You should say, **Spacecraft, this is Mars control.**  
**Fold the pattern up along line 4 so that the point you just made touches line 3. OVER.**
- E. When your teammate is ready to proceed, send the following message. You should say, **Spacecraft, this is Mars control.**  
**Fold the pattern up along lines 5 and 6. The points with an asterisk (\*) should touch at line 3. OVER.**
- F. When your teammate is ready to proceed, send the following message. You should say, **Spacecraft, this is Mars control.**  
**Make sure the entire edge does not touch. Only the points should touch. The nose section at the bottom should now be flat instead of pointed. The nose should be about 3-4 cm wide. OVER.**

**GO TO THE NEXT TASK CARD**

## Mars Control - 4



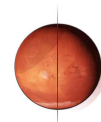
### Constructing the Nose Section (cont.)

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- G. When your teammate is ready to proceed, send the following message. You should say: **Spacecraft, this is Mars control.**  
**Fold down the small triangle along line 7 to cover the points with the asterisks (\*). OVER.**
- H. When your teammate is ready to proceed, send the following message. You should say: **Spacecraft, this is Mars control.**  
**It is now time for a crew change. This is a scheduled "hold" in construction. I will prepare Mars control for your arrival. OVER.**
- I. At this time you need to prepare Mars control for your teammate. Make sure the manual is left in proper order on the page where your teammate needs to begin.
- J. Switch roles.

**GO TO THE NEXT TASK CARD**

Mars Control - 5

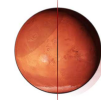


**Constructing the Wings**

- A. Your job in Mars control is to ensure that the airplane is constructed correctly.
- B. You will be in constant contact with your teammate in the spacecraft.
- C. When you send a message to your teammate, please use the proper procedures. Say only what is given in this manual.
- D. You may be asked to repeat directions. Do so quickly. Wait until your teammate tells you that he or she is ready to proceed before moving to the next step.
- E. When your teammate is ready to proceed, send the following message. You should say,  
**Spacecraft, this is Mars Control.**  
**We will now construct the wings of the airplane. Fold the pattern up along lines 8 and 9 so that the points with the dot touch line 3. Be sure that ONLY the points with the dots touch, not the whole edge. OVER.**

**GO TO THE NEXT TASK CARD**

Mars Control - 6

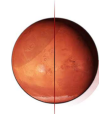


**Constructing the Wings (cont.)**

- F. When your teammate is ready to proceed, send the following message: You should say,  
**Spacecraft, this is Mars control.**  
**Pick up the airplane and fold along line 3 so that the dots are facing out. OVER.**
- G. When your teammate is ready to proceed, send the following message. You should say,  
**Spacecraft, this is Mars Control.**  
**Turn the airplane so that line 3 is along the bottom. Lift up the wings that have dots on them. This is the top of the airplane. The wings should be at a 90 degree angle to the body of the plane. OVER.**

**GO TO THE NEXT TASK CARD**

## Mars Control - 7

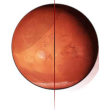


### Constructing the Tail

- A. When your teammate is ready to proceed, send the following message. You should say,  
**Spacecraft, this is Mars control.**  
**Hold the bottom of the airplane together and cut the body along line 10 with the scissors. OVER.**
- B. When your teammate is ready to proceed, send the following message. You should say,  
**Spacecraft, this is Mars control.**  
**Turn the airplane over so that the wings with the dots are on top. Reach between the wings at the back of the airplane and pull the loop (tail) that was made by cutting along line 10 up. It should rise above the wings. OVER.**

**GO TO THE NEXT TASK CARD**

## Mars Control - 8

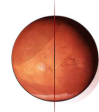


### Preparing for the Mission

- A. When your teammate is ready to proceed, send the following message: You should say,  
**Spacecraft, this is Mars control.**  
**Put the paper clip on one side of the nose of the airplane for stability. Spread the wings apart. We have now finished our task. Together, let's see if the airplane will fly. OVER.**
- B. You and your teammate may now test the airplane

**GO TO THE NEXT TASK CARD**

## Mars Transport Vehicle - 1

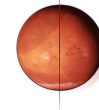


### Airplane Construction

1. Your job in the spacecraft is to construct an airplane with guidance from Mars control. You have all of the materials necessary to build the airplane. Your Mars control teammate has all of the necessary directions.
2. You will have constant contact with your teammate in the spacecraft.
3. You will begin the construction of the airplane. Halfway through construction, you and your teammate will change positions and roles, and your teammate has all of the necessary directions.

**GO TO THE NEXT TASK CARD**

## Mars Transport Vehicle - 2



### Airplane Construction (cont.)

4. When you "send" a message to your teammate, please use the proper procedures. Say only what is given in this manual.
5. Make sure you have all of the necessary materials. You will need the airplane pattern, paper clips, and a pair of scissors.
6. Your teammate will send you all of the directions for the construction of the airplane.

**GO TO THE NEXT TASK CARD**

## Mars Transport Vehicle - 3

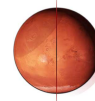


### Airplane Construction (cont.)

7. Respond to any questions or statements from Mars Control as needed. If you need the directions repeated, send the following message. You should say,  
**Mars control, this is spacecraft.  
Please repeat the direction. OVER.**
8. When you complete the directions given, send the following message. You should say,  
**Mars control, this is spacecraft.  
I have completed those instructions. Proceed. OVER.**

**GO TO THE NEXT TASK CARD**

## Mars Transport Vehicle - 4



### Airplane Construction (cont.)

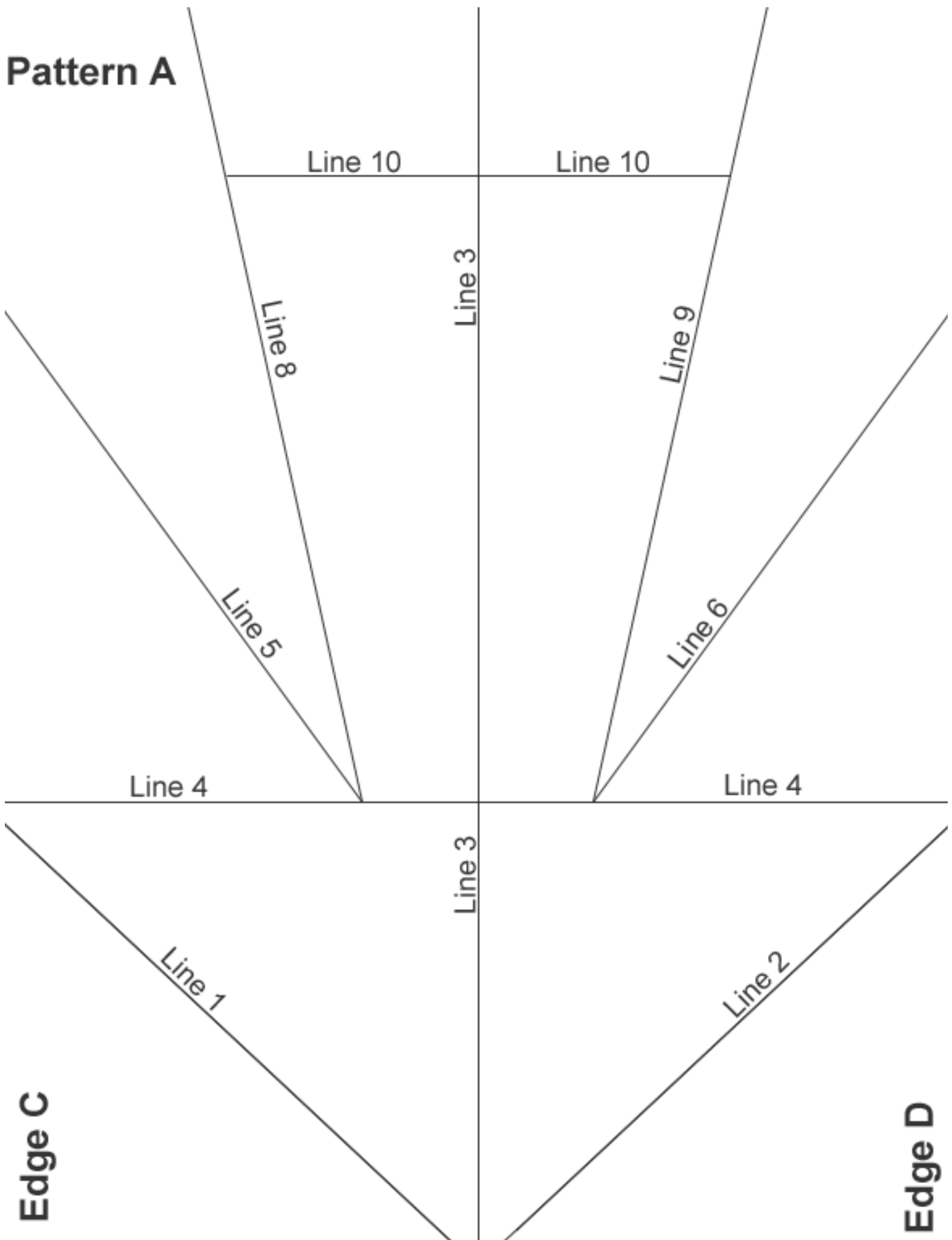
9. When your teammate asks if you are ready to begin, send a message to him or her. You should say,  
**Mars control, this is spacecraft.  
I am ready to begin. OVER.**
10. When your teammate informs you that it is time for a crew change, it is time for you to prepare the Mars transport vehicle for your teammate. Make sure the airplane is left in proper order and in position for your teammate.

**Remember:**

When you complete the directions given, send the following message. You should say:  
**Mars control, this is Spacecraft.  
I have completed those instructions. Proceed. OVER.**

**GO TO THE NEXT TASK CARD**

**Pattern A**





# Pattern B

