

SCORECARD: Space Capsule Drop (Grades 6-8)

+ DIRECTIONS

Complete the chart below by circling the scores your design received for the criteria and writing the score down in the “Score” column. Calculate your score when testing is completed and decide as a team if you can improve your score.

CRITERIA	3 POINTS	2 POINTS	1 POINT	0 POINTS	SCORE
COLLABORATION		The design has elements contributed by all team members.	The design has elements contributed by two team members.	The design does not have elements from each team member.	
REUSABILITY	The space capsule has no damage.	The space capsule has minor damage.	The space capsule would need repairs to be tested again.	The space capsule cannot be used again, and the damage is beyond repair.	
SAFETY	There is a seat for the astronaut and the astronaut stays seated throughout testing.	There is a seat for the astronaut, but the astronaut falls out of it by the end of testing.	There is a seat for the astronaut, but the seat moves by the end of testing.	There is no seat for the astronaut.	
WEIGHT	The space capsule weighs under 32 grams.	The space capsule weighs between 32.0-40.0 grams.	The space capsule weighs between 40.1-48.0 grams.	The space capsule weighs over 48.0 grams.	
FORCE	The space capsule's landing force is less than 5g.	The space capsule's landing force is less than 10g, but greater than 5g.	The space capsule landing force is less than 15g, but greater than 10g.	The space capsule landing force is greater than 15g.	
BUDGET USED	\$750,000 or less.	\$751,000 – \$899,999.	\$900,000 – \$1,000,000.	\$1,000,001 or more.	
BONUS: LANDING ZONE	The space capsule lands directly in the landing zone.	The space capsule lands within 8 cm of the landing zone.	The space capsule lands within 16 cm of the landing zone.	The space capsule lands over 16 cm from the landing zone.	
TOTAL SCORE					

Record your distance and time here for each test run. Calculate speed by using the formula: speed = distance / time. Record the result of the force indicator test. Consider the questions and hints below to improve your design.

TEST #	DISTANCE (meters)	TIME (seconds)	SPEED (m/sec)	FORCE RECORDED (color on indicator)	Was the astronaut injured during the landing?
1					
2					
3					

Green Force Indicator:

Congratulations, your astronaut returned safely to Earth. Could your design be improved by lowering the cost while still maintaining a safe flight?

Orange Force Indicator:

Your astronaut sustained minor injuries in the return landing. Redesign your capsule so that the returning speed is slower. This can be done by adjusting the mass of the capsule. (Hint: remove nonessential materials from the design)

Yellow Force Indicator:

Your astronaut did not survive the landing. Redesign your capsule so that the returning speed is slower, or the capsule absorbs more impact. This can be done by adjusting the mass of the capsule and adding a protective layer to the capsule. (Hint: remove nonessential materials from the design and add impact-absorbing materials)