



ROBOT RESPONDERS

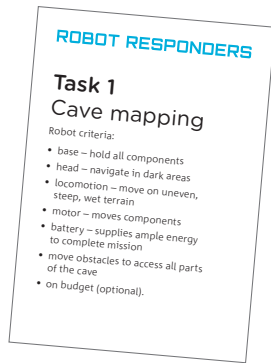
NATIONAL SCIENCE EXPERIMENT 2026

The objective of this game is to design the best robot to complete a specific real-world mission. To win, a player's robot must contain all required components, meet the task criteria AND stay within budget! This game is designed for 2-4 players or teams.

DESIGNING A ROBOT

To complete a mission, a player's robot MUST include at minimum these 5 essential components:

- 1 Base
- 2 Head
- 3 Locomotion
e.g. wheels, tracks, etc.
- 4 Motor
- 5 Battery



A player may have to add up to 3 bonus components (arms, LiDAR, etc.) to complete the mission. Be sure to read the Task card carefully.

All robots are equipped with a computer and controller to start, so players do not need to add this into their design.

Players should familiarise themselves with all cards before they begin playing.

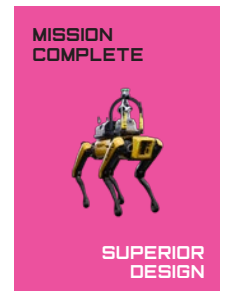
COMPLETING THE MISSION

If player draws a Mission Complete card, they can only win if:

- Their robot is fully built (all essential and any necessary bonus components).
- They can explain how their design meets all the robot criteria listed on the Task card with the cards in their hand.
- The other player(s) approve the design.
- Design stays within the 100-credit budget (optional).

MISSION COMPLETE CARDS

Can ONLY be used to complete a mission. This will be the LAST card a player will pick up from the draw pile. If Mission Complete card is dealt at the start of the game, discard and add to centre of draw pile and choose a new card from the draw pile.



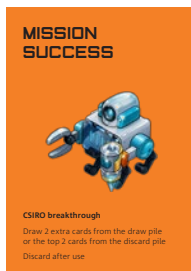
If a player's robot is incomplete, they MUST discard the card!

ACTION CARDS

These cards provide an advantage or disadvantage to a player. They can be played when it's a player's turn after they draw a card. Players MUST discard after using the action card.



Mission mishap
Player gives 1 card from their hand to another player.



Mission success
Draw 2 cards from the draw pile or the top 2 cards from the discard pile.



Component repair
Swap one card with another player.



Wild card
Takes the place of one component card. Player must state what the component it is when explaining how their robot design meets the task criteria to win the game.



THINK LIKE AN ENGINEER

Use the Task card to guide robot design:

- Can the robot move successfully in the environment?
- Does it have all the needed components to complete the task of the mission?
- Will the robot survive the dirty, dangerous, and/or dull environment of the mission?
- Is the design within budget?

Be ready to explain the design choices!

BUDGET CHALLENGE (OPTIONAL)

- Each player has a budget of 100 credits.
- Every card has a cost.
- Player's robot must stay within budget, or it cannot complete the mission!

Typical component costs:

Basic components = 10 – 15 credits

Advanced components = 20 – 30 credits

Bonus components = 10 – 30 credits

Action cards = 0 credits

Engineers balance performance and cost!

SET-UP

1. Print and cut out all cards (pages 3–11). Fold and glue Mission and Task cards (pages 3–5).
2. Sort Mission and Task cards into 2 piles.
3. The shortest player chooses 1 Mission card for the round.
4. Find the Task card that matches the Mission card.
5. Players should refer to the Task card throughout the game to ensure they are designing a robot that meets the mission criteria.
6. Decide who will be the dealer for the round.
7. The dealer reads the Mission card, and a different player reads the Task card to the group.
8. Place the extra Mission and Task cards off to the side. Players will not need these for this round.
9. Shuffle the component and action cards.
10. Dealer will deal 5 cards to each player.
11. Players should organise their hand, remember robots must have the essential 5 components, and should improve the robot design with BONUS Components cards that will give the design the extra components needed to successfully complete the mission.
12. Place the remaining cards face down in the centre of the table (draw pile).
13. Decide if the round will be played with the Budget challenge before beginning.

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HOW TO PLAY

The player to the left of the dealer will start.

On a player's turn they will:

1. Draw 1 card from the draw pile or draw the LAST card that was discarded to the discard pile.
2. Decide if they are going to keep or discard the card. A player does not need to discard on every turn and can discard as many cards as they would like.
3. Place any cards the player does not want to the discard pile.
4. The player may only have 8 cards in their hand at one time. Players MUST discard a card when they have more than 8 cards.
5. If the player draws the Mission Complete card and their robot is complete and they have more than 8 cards, they MUST discard any additional cards.

WINNING THE GAME

The winner is the player/team that:

- Draws a Mission Complete card once they have designed a robot that meets ALL the robot criteria on the Task card.
- Has provided an explanation for how their design meets all the robot criteria included on the Task card.
- Has the approval of ALL other player(s) that the robot meets all robot criteria to complete the mission.
- Has a design within the 100-credit budget (optional).

GAME TIP

If the draw pile runs out, flip the discard pile over and keep playing!

FINAL CHALLENGE

The best robots aren't always the most expensive... They're the cleverest designs for the mission!



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COMPONENT



CATEGORY
Base

NAME
Compact
core

COST
10 credits

ABILITY
Structural
foundation

BEST FOR
Long
missions and
low power
builds

COMPONENT



CATEGORY
Base

NAME
Standard
frame

COST
15 credits

ABILITY
Structural
foundation

BEST FOR
Balanced
builds
and most
scenarios

COMPONENT



CATEGORY
Base

NAME
Heavy
platform

COST
20 credits

ABILITY
Structural
foundation

BEST FOR
Short missions
and high
component
loads

COMPONENT



CATEGORY
Locomotion

NAME
Standard
wheels

COST
10 credits

ABILITY
Movement
on terrain

BEST FOR
Flat terrain

COMPONENT



CATEGORY
Locomotion

NAME
Rubber
tracks

COST
15 credits

ABILITY
Movement
on terrain

BEST FOR
Handles
rubble and
mild slopes

COMPONENT



CATEGORY
Locomotion

NAME
Quadruped
legs

COST
20 credits

ABILITY
Movement
on terrain

BEST FOR
Climbs rocks
and steps

COMPONENT



CATEGORY
Locomotion

NAME
Single
thruster

COST
15 credits

ABILITY
Moves
through
water

BEST FOR
Short
missions

COMPONENT



CATEGORY
Locomotion

NAME
Multi-thruster
4x

COST
20 credits

ABILITY
Moves
through
water

BEST FOR
Long
missions

COMPONENT



CATEGORY
Locomotion

NAME
Omni-
thruster

COST
25 credits

ABILITY
Moves
through
water

BEST FOR
Long
distance
missions

COMPONENT



CATEGORY
Head (camera)

NAME
Single
grayscale
camera

COST
10 credits

ABILITY
Enables
robot
to see

BEST FOR
Detecting
basic
objects

COMPONENT



CATEGORY
Head
(camera)

NAME
HD colour
camera

COST
15 credits

ABILITY
Enables
robot to see

BEST FOR
Detecting
objects
in dark
environments

COMPONENT



CATEGORY
Head
(camera)

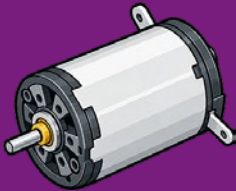
NAME
Humanoid
head

COST
20 credits

ABILITY
Enables
robot to see

BEST FOR
Detecting
objects with
a wider field
of view

COMPONENT



CATEGORY
Motor

NAME
Brushed DS

COST
10 credits

ABILITY
Moves
components

BEST FOR
Long
missions and
low speed

COMPONENT



CATEGORY
Motor

NAME
Brushless

COST
15 credits

ABILITY
Moves
components

BEST FOR
Short
missions
and medium
speed

COMPONENT



CATEGORY
Motor

NAME
High torque

COST
20 credits

ABILITY
Moves
components

BEST FOR
Short
missions and
high speed

COMPONENT



CATEGORY
Head
(camera)

NAME
Stereo vision
head

COST
25 credits

ABILITY
Enables
robot to see

BEST FOR
Detecting
objects with
higher depth
accuracy

COMPONENT



CATEGORY
Head
(camera)

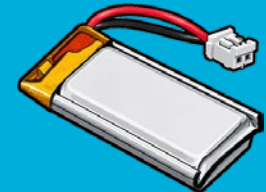
NAME
Thermal
camera head

COST
30 credits

ABILITY
Enables
robot to see

BEST FOR
Detecting
heat sources

COMPONENT



CATEGORY
Battery

NAME
Small
capacity

COST
10 credits

ABILITY
Energy
source

BEST FOR
Short
missions,
limited
energy

COMPONENT



CATEGORY
Battery

NAME
Medium capacity

COST
15 credits

ABILITY
Energy source

BEST FOR
Mid-length missions, reliable energy

COMPONENT



CATEGORY
Battery

NAME
High capacity

COST
20 credits

ABILITY
Energy source

BEST FOR
Long missions, high energy

COMPONENT



CATEGORY
Battery

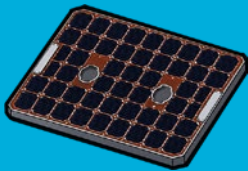
NAME
Solar panel

COST
15 credits

ABILITY
Energy source

BEST FOR
Short missions in high direct sunlight

COMPONENT



CATEGORY
Battery

NAME
Solar array

COST
20 credits

ABILITY
Energy source

BEST FOR
Long missions in high direct sunlight

COMPONENT

BONUS



CATEGORY
Arm

NAME
Basic gripper

COST
10 credits

ABILITY
Completes specific tasks

BEST FOR
Picking-up objects with 50% accuracy

COMPONENT

BONUS



CATEGORY
Arm

NAME
Robotic arm

COST
15 credits

ABILITY
Completes specific tasks

BEST FOR
Picking-up objects with 80% accuracy

COMPONENT

BONUS



CATEGORY
Arm

NAME
Drill arm

COST
25 credits

ABILITY
Completes specific tasks

BEST FOR
Breaking through obstacles

COMPONENT

BONUS



CATEGORY
Arm

NAME
Precision soft robotic arm

COST
20 credits

ABILITY
Completes specific tasks

BEST FOR
Picking-up objects with 95% accuracy

COMPONENT

BONUS



CATEGORY
Arm

NAME
Laser arm

COST
30 credits

ABILITY
Completes specific tasks

BEST FOR
Breaking through obstacles with high accuracy

COMPONENT

BONUS



CATEGORY
LiDAR

NAME
2D LiDAR

COST
10 credits

ABILITY
Mapping and navigation

BEST FOR
Basic mapping and obstacle detection

COMPONENT

BONUS



CATEGORY
LiDAR

NAME
3D Spinning LiDAR

COST
20 credits

ABILITY
Mapping and navigation

BEST FOR
Detailed mapping and obstacle detection

COMPONENT

BONUS



CATEGORY
Shell

NAME
Active cooling and heating

COST
15 credits

ABILITY
Protects internal components

BEST FOR
Full protection from damage

COMPONENT

BONUS



CATEGORY
Shell

NAME
Pressure housing

COST
15 credits

ABILITY
Protects internal components

BEST FOR
Full protection from high pressure

WILD CARD

Use this card in place of any component card

This card does not affect your budget

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Use this card in place of any component card

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MISSION COMPLETE



SUPERIOR DESIGN

MISSION COMPLETE



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MISSION COMPLETE



SUPERIOR DESIGN

MISSION MISHAP



Mechanical misfortune
Give 1 card from your hand to another player
Discard after use

MISSION MISHAP



Mechanical misfortune
Give 1 card from your hand to another player
Discard after use

MISSION MISHAP



Mechanical misfortune
Give 1 card from your hand to another player
Discard after use

MISSION SUCCESS



CSIRO breakthrough

Draw 2 extra cards from the draw pile or the top 2 cards from the discard pile

Discard after use

MISSION SUCCESS



CSIRO breakthrough

Draw 2 extra cards from the draw pile or the top 2 cards from the discard pile

Discard after use

MISSION SUCCESS



CSIRO breakthrough

Draw 2 extra cards from the draw pile or the top 2 cards from the discard pile

Discard after use

COMPONENT REPAIR



Mishap protection

Swap one card with another player

Discard after use

COMPONENT REPAIR



Mishap protection

Swap one card with another player

Discard after use

COMPONENT REPAIR



Mishap protection

Swap one card with another player

Discard after use