

# Engineer, engineer, everywhere

Science

## [SECTION 1: INTRODUCTION / ACTIVITY RATIONALE]

Engineering is not only something that happens in laboratories, factories or large construction sites. It is also part of children's everyday lives. When children build with blocks, design a bridge, draw a map, follow steps to bake a cake, solve a problem, or help a robot move safely from one place to another, they are already engaging in early engineering thinking.

This activity invites children to explore the question:

Who are the engineers around us?

Teachers can begin by asking children to think about people who design, build, fix, plan or solve problems in their everyday world. These people might include builders, electricians, carpenters, mechanics, pilots, drone designers, software engineers, water engineers, bridge designers, robotics engineers, or even family members who cook, repair, design or create things at home.

## [SECTION 2: SCIENTIFIC INQUIRY PROVOCATION]

- Scientific Inquiry Provocation
- Can you find engineers in your everyday life?
- Can you design a robot that helps people solve a real problem?



## [SECTION 3: TEACHER PROMPTS / DISCUSSION QUESTIONS]

### Teacher Prompts

- What do engineers do?
- Do engineers draw, design, build, test, fix or improve things?
- Where can we see engineering in our classroom, home, playground or community?
- Can baking a cake be an engineering activity? Why?
- What steps do we need to follow when we build something?

- What materials do we need?
- How do we know if our design works?
- What can we do if it does not work the first time?

## [SECTION 4: MAIN ACTIVITY — ENGINEERING ROLE PLAY]

### Engineering Role Play

You are an Everyday Engineer.

Choose a problem that your robot can help solve in your classroom, home, kinder or local community.

Your robot might help to:

move safely around the classroom

deliver healthy food to friends

help clean up rubbish

water plants in the garden

build a bridge for toys or animals

carry messages from one place to another

keep people safe near water, roads or fire

help children find a safe path through a map

## [SECTION 5: DESIGN AND BUILD — ROBOT WORLD CREATION]

### Design Your Engineering World

Invite children to draw or construct a place where their robot will work.

Children can use:

- paper and markers
- blocks
- recycled materials
- loose parts
- Lego
- cardboard
- fabric
- natural materials
- toy people, animals or vehicles

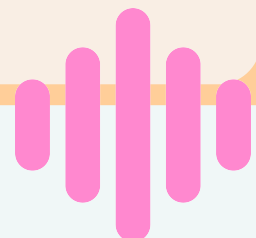
### Teachers can encourage children to move from 2D to 3D thinking:

First, draw your engineering idea.

Then, build your design.

Next, test how your robot moves through it.

Finally, improve your design if something does not work.



## [SECTION 6: CODING CHALLENGE]

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### Robot Coding Challenge

Code Botley, Dash, Tale-Bot or another robot to move through the engineering world.

#### Can your robot:

- travel from one point to another?
- avoid obstacles?
- stop at the right place?
- visit different engineering stations?
- deliver or collect an object?
- follow a sequence of steps?
- respond to a problem in the story?

## [SECTION 7: EXTENSION ACTIVITY — ENGINEER IDENTITY CARD]

### Extension Activity

Invite children to create their own engineer identity card.

Name: I am a: My robot is called:

My robot helps by:

My robot needs:

My robot solves this problem:

Children can also interview a family member or community member:

#### Do you design, build, fix or improve things?

- What tools do you use?
- What problems do you solve?
- How do you know if something works?

## [SECTION 8: END OF PROJECT / SHARING ACTIVITY]

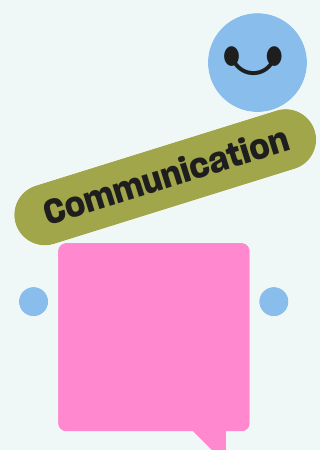
### End of Project or Activity

Invite children to present their engineering world to the group.

#### Children can explain:

- what problem their robot solves
- what kind of engineer they are role-playing
- how they designed and built their space
- what happened when they tested their robot
- what they changed or improved

Teachers may also invite children to record a short video or audio story explaining their robot's engineering journey.



A Coding Day or Engineering Day can be organised where children share their robot worlds with families and code their robots through the designed spaces.

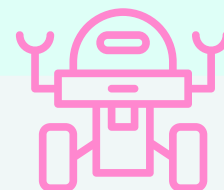
## [SECTION 9: LEARNING OUTCOMES]

### Learning Outcomes

- Learning Outcome 2: Children are connected with and contribute to their world
- Children develop a sense of belonging to groups and communities.
- Children become socially responsible and show respect for the environment.
- Children begin to understand how people work together to solve community problems.

- Learning Outcome 4: Children are confident and involved learners
- Children develop dispositions for learning such as curiosity, cooperation, confidence, creativity, commitment, enthusiasm, persistence, imagination and reflexivity.
- Children use play to investigate, imagine and explore ideas.
- Children create and use representation to organise, record and communicate mathematical and scientific ideas.

- Learning Outcome 5: Children are effective communicators
- Children interact verbally and non-verbally with others for a range of purposes.
- Children express ideas and make meaning using a range of media.
- Children use digital technologies to access information, investigate ideas and represent their thinking.



## [SECTION 10: SCIENTIFIC AND ENGINEERING SKILLS]

- Scientific and Engineering Skills Children May Engage With
- observing and questioning everyday problems
- designing and testing simple solutions
- using sequencing and algorithms
- moving from 2D drawing to 3D construction
- reflecting on what worked and what could be improved
- developing an awareness of how science, technology and engineering shape everyday life
- exploring cause and effect
- using materials creatively
- communicating design ideas
- collaborating with peers