

Machine makers Assessment Rubrics

Year 2 Achievement Standard

By the end of Year 2, **students describe changes to objects**, materials and living things. They identify that certain materials and resources have different uses and describe examples of where science is used in people’s daily lives.

Students pose and respond to questions about their experiences and predict outcomes of investigations. They use informal measurements to make and compare observations. They record and represent observations and communicate ideas in a variety of ways.

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SCIENCE UNDERSTANDING: A push or a pull affects how an object moves or changes shape (ACSSU033)					
Science Understanding – Physical sciences	Describes changes to objects	Describes the effects of push and pull forces on the movement of objects: <ul style="list-style-type: none"> L1: Annotates ‘Dog treat feeder’ machine image with descriptions of how push and pull forces move objects on ‘Give the dog a treat’ (RS1) L1S1: Contributes to class ‘Pushes and pulls’ T-chart L2S1: Records pushes and pulls on ‘Push pull pursuit’ (RS2) L2S2: Describes different ways to make a toy car move (class ideas map and team discussions) L3: Observes and records how far a toy car moved as a result of push forces from a ball rolling down ramps of different heights on ‘Higher and higher’ (RS3) L4: Describes effects of changing the type of ball on how much push it exerts on a lever that pushes a toy car on ‘Mini machine’ (RS5) 	Requires support to identify effects that are related to the push and pull forces and/or movement of objects	Identifies contact push and pull forces and their associated effects on objects for situations presented	Identifies push and pull forces, including non-contact forces, such as gravity and their effects on objects Suggests appropriate forces to apply in new situations

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SCIENCE UNDERSTANDING: A push or a pull affects how an object moves or changes shape (ACSSU033)					
Science Understanding – Physical sciences	Describes changes to objects	<p><i>Continued:</i> Describes the effects of push and pull forces on the movement of objects:</p> <ul style="list-style-type: none"> L6: Draws and annotates machines with pushes and pulls to show how they work on ‘Why won’t it work?’ (RS8) L8: Presents to the class how their Rube Goldberg machine uses pushes and pulls to make objects move L8: Describes an annotated diagram of their favourite/reimagined Rube Goldberg machine, including effects of pushes and pulls <i>*(optional)</i>. 	Requires support to identify effects that are related to the push and pull forces and/or movement of objects	Identifies contact push and pull forces and their associated effects on objects for situations presented	Identifies push and pull forces, including non-contact forces, such as gravity and their effects on objects Suggests appropriate forces to apply in new situations
SCIENCE AS A HUMAN ENDEAVOUR: Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE034)					
Nature and development of science	Poses and responds to questions about their experiences in order to understand investigations or ask questions with regard to everyday lives	Suggests scientific ways to investigate changes to objects in discussions before the investigations in Lessons 3, 4 and 5 <i>(optional)*</i> .	Requires support to suggest scientific ways to investigate push and pull forces	Suggests ways to investigate push and pull forces that involves asking questions, observing and describing	Suggests scientific ways to investigate push and pull forces; including asking investigable questions, observing, measuring and describing

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SCIENCE AS A HUMAN ENDEAVOUR: Science involves observing, asking questions about, and describing changes in, objects and events (ACSHE034)					
Nature and development of science	Poses and responds to questions about their experiences in order to understand investigations or ask questions with regard to everyday lives	Suggests scientific ways to investigate changes to objects in discussions before the investigations in Lessons 3, 4 and 5 (<i>optional</i>)*.	Requires support to suggest scientific ways to investigate push and pull forces	Suggests ways to investigate push and pull forces that involves asking questions, observing and describing	Suggests scientific ways to investigate push and pull forces; including asking investigable questions, observing, measuring and describing
SCIENCE AS A HUMAN ENDEAVOUR: People use science in their daily lives, including when caring for their environment and living things (ACSHE022)					
Use and influence of science	Describes examples of where science is used in people's daily lives	<ul style="list-style-type: none"> L2 S1: Observes and records pushes and pulls at school on 'Push pull pursuit' (RS2) L2 S1: Observes and records pushes and pulls at home on 'Push pull pursuit' (RS2) (<i>optional</i>) L3-L5: Shares, or listens to others', observations of pushes and pulls from home* (<i>optional</i>). 	Makes simple observations about push and pull forces in their home environment	Describes how people use push and pull forces in their home environment	Describes how people in their home environment use push and pull forces, and discusses why they might be useful

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SCIENCE INQUIRY SKILLS: Pose and respond to questions, and make predictions about familiar objects and events (AC SIS037)					
Questioning and predicting	Poses and responds to questions about their experiences and predicts outcomes of investigations	Responds to questions and makes predictions during discussion about guided investigations in Lessons 3, 4, 5 and 7-8: <ul style="list-style-type: none"> • L1: Responds to questions about how the dog treat feeder works • L1: Poses questions about how the machine works and how to design a pet treat feeder machine on the 'Our questions' page in the class science journal • L2: Contributes to the class ideas map • L3: Makes predictions on 'Higher and higher' (RS4) • L5: Makes predictions on 'Lunchtime' (RS7) • L7-8: Poses and responds to questions about their own or other teams' Rube Goldberg machines*. 	Responds to questions about familiar objects during investigations	Responds to questions and makes predictions about changes to familiar objects during investigations	Poses and responds to questions during investigations and makes predictions of the outcomes for investigations

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SCIENCE INQUIRY SKILLS: Participate in guided investigations to explore and answer questions (AC SIS038)					
Planning and conducting	Participates in guided investigations	Participates in investigations according to guidelines, including fulfilling their role as Manager or Speaker (see Appendix 1): <ul style="list-style-type: none"> L2: Participates in investigation to identify pushes and pulls to move a toy car L3: Participates in the ramp height investigation L4: Participates in the lever investigation L7 (S1 & S2): Participates in the design investigation to construct a Rube Goldberg machine*. 	Requires support to follow procedures and/or fulfil their role in guided investigations	Follows procedures and fulfils their role in guided investigations	Follows procedures and fulfils their role in guided investigations and explains how the guidelines relate to the investigation question
SCIENCE INQUIRY SKILLS: Use informal measurements to collect and record observations, using digital technologies as appropriate (AC SIS039)					
Planning and conducting	Uses informal measurements to make and compare observations	Uses informal measurements to make and compare observations during investigations. <ul style="list-style-type: none"> L3: Using and comparing pop stick width or lengths to measure the distance travelled by a toy car L5: Compares pull strength required with and without the use of a pulley L7: <i>Uses informal measurements to test their Rube Goldberg machine*(optional).</i> 	Requires support to use informal measurements to collect and record observations	Follows instructions to use informal measurements to record observations	Independently uses informal measurements to collect and record observations

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SCIENCE INQUIRY SKILLS: Use a range of methods to sort information, including drawings and provided tables, and through discussion, compare observations with predictions (ACSIS040)					
Processing and analysing data and information	Records and represents observations in a variety of ways	Records observations and ideas in provided formats: <ul style="list-style-type: none"> • L1: Records annotations on ‘Give the dog a treat’ (RS1) • L2 S1: Records observations in the table on ‘Push pull pursuit’ (RS2) • L2 S2: Records descriptions and drawings in the table on ‘Make it go!’ (RS3) • L3: Records observations and explanations on ‘Higher and higher’ (RS4) • L4: Records and describes observations on ‘Mini machine’ (RS5) • L5: Records observations in an annotated drawing on ‘Lunchtime’ (RS6) • L6: Records annotations and drawings on ‘Why won’t it work?’ (RS8) • L7 S1: Draws and annotates ideas on ‘Our Rube Goldberg machine’ (RS9) • L8: Draws and annotates observations and ideas in an annotated diagram* (<i>optional</i>). 	Requires support to record observations on provided resource sheets and/or using appropriate literacy focuses	Follows instructions to sort observations on resource sheets and according to literacy focus descriptions	Independently records and represents observations on provided resource sheets and discusses the choices of representations

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SCIENCE INQUIRY SKILLS: Compare observations with those of others (ACSIS041)					
Evaluating	Represents observations and communicates ideas with others	Shares their observations in class discussions after investigations in Lessons 3, 4 and 5*.	Requires support to share their observations with others	Shares their observations with others	Shares observations with others and discusses differences
SCIENCE INQUIRY SKILLS: Represent and communicate observations and ideas in a variety of ways (ACSIS042)					
Communicating	Represents observations and communicates ideas in a variety of ways	Represents their ideas and observations in class discussions and by: <ul style="list-style-type: none"> L1: drawing and writing on 'Give the dog a treat' (RS1) L2 S1: drawing and writing on 'Push pull pursuit' (RS2) L2 S2: sharing to class and drawing and writing on 'Make it go!' (RS3) L3: writing on 'Higher and higher' (RS4), and by creating a simple graph (optional). L4: drawing and writing on 'Mini machine' (RS5) L5: drawing and writing on 'Lunchtime' (RS6) L6: drawing and writing on 'Why won't it work?' (RS8) L7 S1: drawing and writing 'Our Rube Goldberg machine' (RS9) L7 S2: creating (and fixing) their machine L8: giving an oral presentation, and by drawing and writing in an annotated drawing* (<i>optional</i>). 	Requires support to represent their ideas and observations	Represents their ideas in several ways, for example through drawings, writing and oral descriptions	Represents and explains their observations and ideas in a variety of ways

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Foundation to Year 2 Design and Technologies Achievement Standard

By the end of Year 2, **students describe the purpose of familiar products, services and environments and how they meet the needs of users and affect others and environments. They identify the features and uses of technologies for each of the prescribed technologies contexts.**

With guidance, students create designed solutions for each of the prescribed technologies contexts. They describe given needs or opportunities. Students create and evaluate their ideas and designed solutions based on personal preferences. They communicate design ideas for their designed products, services and environments using modelling and simple drawings. Following sequenced steps, students demonstrate safe use of tools and equipment when producing designed solutions.

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DESIGN AND TECHNOLOGIES UNDERSTANDING: Identify how people design and produce familiar products, services and environments and consider sustainability to meet personal and local community needs (ACTDEK001)					
Design and Technologies Knowledge and Understanding	Describes the purpose of familiar products and how they meet the needs of users and affect others and environments	Describes how simple machines meet the needs of users: <ul style="list-style-type: none"> L4: Discusses why ramps are useful L5: Discusses how a pulley can assist lifting heavy items, such as delivering lunch to people in a treehouse. 	Requires support to describe how simple machines meet the needs of users	Describes how simple machines meet the needs of users	Explains how simple machines meet the needs of users
	Explore how technologies use forces to create movement in products (ACTDEK002)				
	Identifies the features and uses of technologies for engineering principles and systems	Identifies, and conducts investigations with, simple machines to solve problems requiring movement: <ul style="list-style-type: none"> L7 S2: Identifies and uses simple machines to make objects move the way they want L8: Identifies simple machines to make objects move the way they want*. 	Requires support to identify simple machines and how to use them to make things move	Identifies simple machines including a ramp and lever (and pulley) and uses them appropriately to make things move	Identifies simple machines and explains how they can be used to make things move

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Design and Technologies Knowledge and Understanding	Explore the characteristics and properties of materials and components that are used to produce designed solutions (ACTDEK004)				
	Identifies the features and uses of technologies for engineering principles and systems	Identifies the characteristics of simple machine components to produce working machines: <ul style="list-style-type: none"> • L1: Identifies features of the ‘Dog treat feeder’ on ‘Give the dog a treat’ (RS1) • L6: Identifies the problems with the components in the machines in ‘Why won’t it work?’ (RS8) • L7 S1: Draws and annotates the working parts of a design for a Rube Goldberg machine • L7 S2: Assembles simple machines or components to make a working Rube Goldberg machine • L8 (<i>optional</i>): Draws and annotates the working parts of a Rube Goldberg machine*. 	Requires support to identify features that help make simple machines work or not work	Identifies features of simple machines that enable them to work or not work	Identifies features of simple machines and explains how they interact to make the machine work or not work

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DESIGN AND TECHNOLOGIES PROCESS AND PRODUCTION SKILLS: Explore needs or opportunities for designing, and the technologies needed to realise designed solutions (ACTDEP005)					
Design and Technologies Process and Production Skills	Describes given needs or opportunities	Identifies appropriate simple machines or technologies to perform a given task: <ul style="list-style-type: none"> L2 S2: Brainstorms different ways to move a toy car L6: Identifies the problems with the components in ‘Why won’t it work?’ (RS8) and suggests solutions L7: Identifies suitable simple machines or components to make a Rube Goldberg machine*. 	Requires support to identify appropriate simple machines to perform a given task	Identifies appropriate simple machines to perform a given task	Identifies appropriate simple machines to perform a given task and provides elegant solutions to engineering problems
	Generate, develop and record design ideas through describing, drawing and modelling (ACTDEP006)				
	Communicates design ideas for their designed products using modelling and simple drawings	Uses annotated drawings and models to communicate their designs: <ul style="list-style-type: none"> L6: Uses annotated drawings to show solutions to problems in ‘Why won’t it work?’ (RS8) L7 S1: Uses annotated drawings to represent their design for a Rube Goldberg machine L8: Uses an annotated drawing to communicate design idea for an improved Rube Goldberg machine*(<i>optional</i>). 	Annotated drawings lack features, such as descriptions to communicate effectively	Annotated drawings contain all literacy features, such as drawings and descriptions to communicate the design idea	Annotated drawings consist of clean line drawings and detailed descriptions and arrows to show movement or forces to communicate the design idea effectively

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Design and Technologies Process and Production Skills	Use materials, components, tools, equipment and techniques to safely make designed solutions (ACTDEP007)				
	Demonstrates safe use of tools and equipment when producing designed solutions	Selects and uses materials, components, and tools to safely make a Rube Goldberg machine using techniques learned in previous lessons to make simple machine components: <ul style="list-style-type: none"> L7 S2: Safely creates Rube Goldberg machine*. 	Selects inadequate materials, components or tools to design machines and/or uses them unsafely	Selects adequate materials, components and tools to design machines safely	Selects appropriate materials, components and tools and takes great care to use them safely
	Use personal preferences to evaluate the success of design ideas, processes and solutions including their care for environment (ACTDEP008)				
	Evaluates their ideas and designed solutions based on personal preferences	Describes how their Rube Goldberg machine meets the criteria and identifies improvements: <ul style="list-style-type: none"> L7: Discusses improvements to their Rube Goldberg machines* L8: Presents and responds to questions about how their machine meets the design criteria and improvements they could make L8: Chooses favourite Rube Goldberg machine or decides on a better machine and annotates it in a drawing*(<i>optional</i>). 	Requires support to describe how their Rube Goldberg machine meets criteria and to identify improvements	Describes how their Rube Goldberg machine meets criteria and identifies improvements	Explains how and why their Rube Goldberg machine meets criteria and identifies improvements with detailed solutions

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Design and Technologies Process and Production Skills	Sequence steps for making designed solutions and working collaboratively (ACTDEP009)				
	Follows sequenced steps	Follows steps to create simple machines and fulfils their role in their collaborative team: <ul style="list-style-type: none"> • L2: Fulfils role in team • L3: Follows procedure to make a ramp and fulfils role in team • L4: Follows diagram to make a simple machine with a lever and fulfils role in team • L7 S2: Follows the team's design to build Rube Goldberg machine and fulfils role in team*. 	Requires support to follow steps and/or fulfil their role in their collaborative team	Follows steps and fulfils their role in their collaborative team	Independently follows steps and proactively fulfils their role in their collaborative team

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