

# LEARNER GUIDE



**EASY  
GUIDES**  
Australia Pty Ltd

# Civil Construction



**RIIMPO321F**  
wheeled front end loader

**RIIMPO322E**  
tracked front end loader



**RIIMPO318F**  
skid steer loader



**RIIMPO319E**  
backhoe



**RIIMPO320F**  
excavator



**RIIHAN311F**  
integrated tool carrier

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# Plan and prepare for work

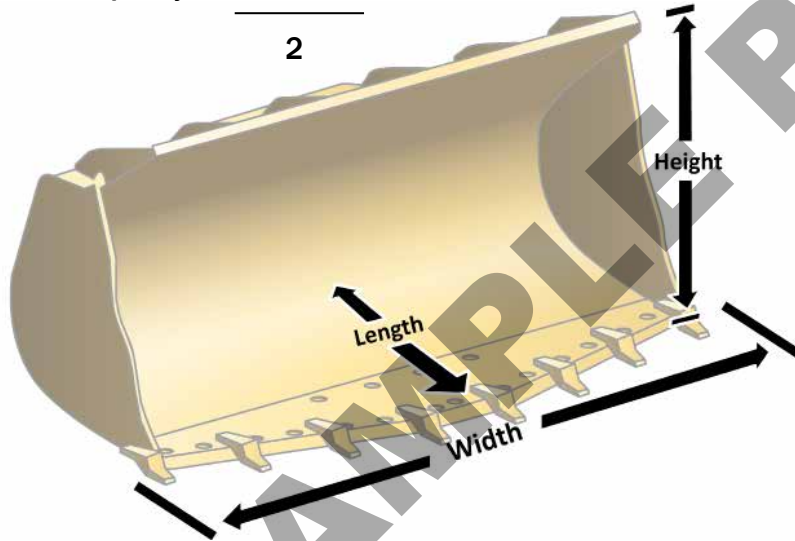


Calculations (continued)

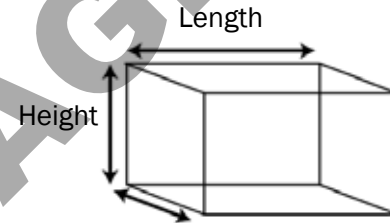
### How to find the cubic capacity of a bucket

The planner must know the capacity of the loader bucket to be able to plan the job. For example, a machine with a larger bucket will move

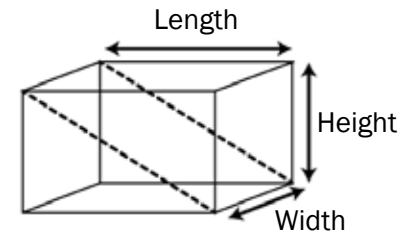
$$\text{Capacity} = \frac{L \times W \times H}{2}$$



Cubic capacity is  $\div 2$  because of the shape of the bucket (a triangular prism)



Cubic capacity of cube  
=  $L \times W \times H$



Cubic capacity of bucket  
=  $L \times W \times H \div 2$

## Identifying workplace hazards

A hazard is anything that can harm you or others while you are working. The first thing you need to do is to identify these hazards before you start work.

Take a good look at your workplace and decide if anything could possibly cause injury to you or anyone else in the area.



### Above head height

You should check above eye level for:

- Powerlines
- Buildings
- Trees
- Other obstructions.



### Ground to eye height

You should check around eye height for:

- Other equipment
- Machinery
- People
- Pedestrians
- Things in the path of travel
- Other obstructions.



### Ground level (and below)

You should check the ground to see:

- If the surface is stable and level
- If there are spills or wet surfaces
- Is there debris/rubbish
- Is the surface strong enough to support the weight of any equipment or materials
- Are there trenches or recently backfilled trenches
- Is the ground unstable.



**QUESTION 9**

What kinds of PPE might you use when using earthmoving equipment?

You might use:

Hard hat



Dust mask



Safety vest



Ear muffs



Gloves



Boots that cover the whole foot



Sunscreen

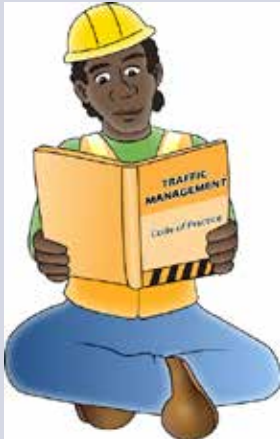


Glasses/ goggles



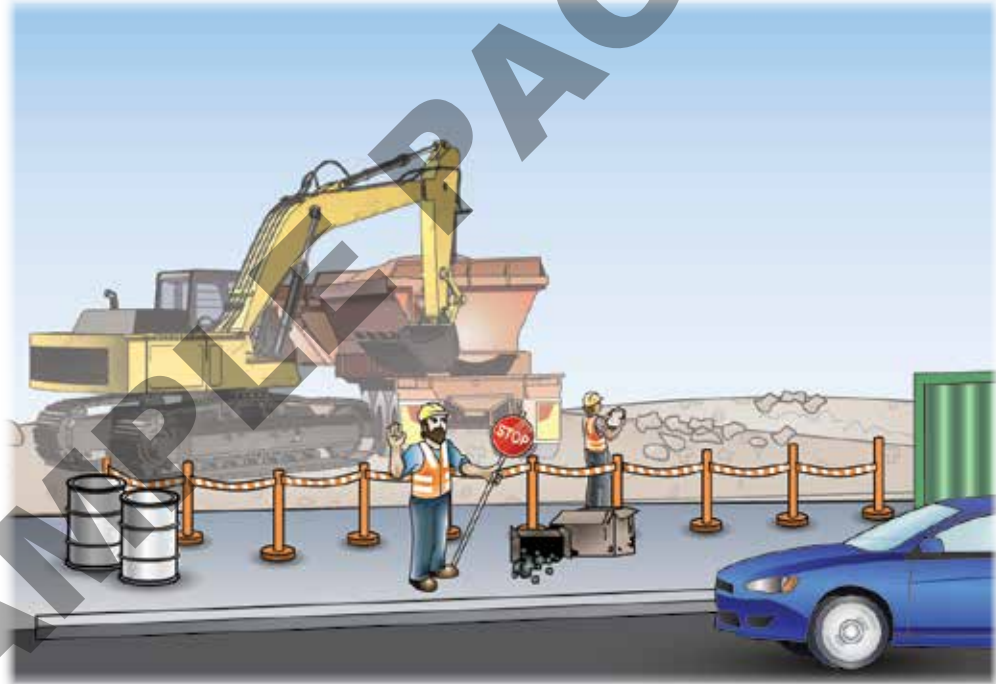
**QUESTION 11**

What does a traffic management plan (TMP) tell you?

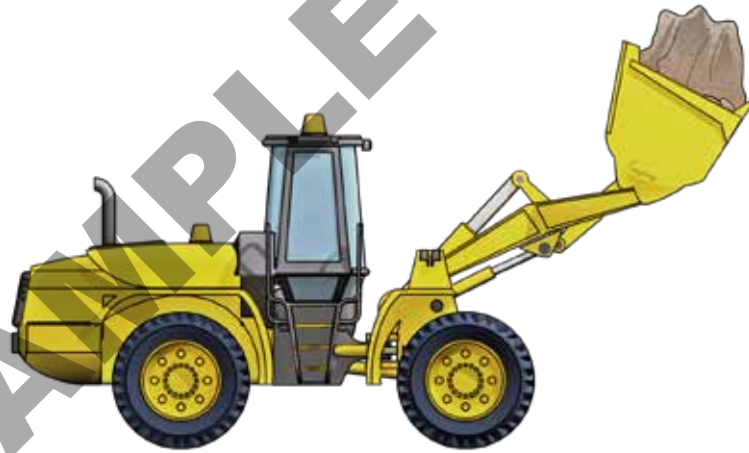


It tells you how to control vehicles in and around the worksite. It helps keep the site safe for you and others.

You may require a traffic control qualification in your state or territory.



# Operate earthmoving machinery





Question 18. What are equipment processes, technical capability and limitations when using earthmoving machinery?

## Equipment Types:

**Bulldozers:** Bulldozers are used for pushing or moving large amounts of earth and debris. They are equipped with a front blade for this purpose.

**Excavators:** Excavators are versatile machines used for digging, trenching, and material handling. They have a digging bucket and a rotating cab mounted on tracks or wheels.

**Loaders:** Loaders are used for scooping and lifting materials like soil, gravel, or construction debris.

**Graders:** Graders are used for leveling and grading surfaces, often in road construction or site preparation.

**Dump trucks:** Dump trucks transport materials such as soil, rocks, or debris from one location to another.

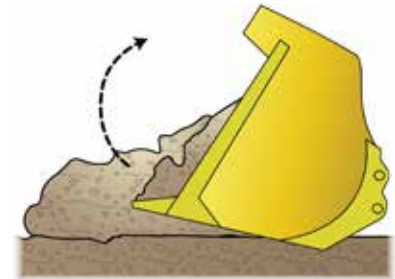
## 2. Technical Capabilities:

**Power and efficiency:** Earthmoving machinery is designed for heavy-duty tasks and can move large quantities of material efficiently.

**Precision and control:** Many machines have precise controls for digging, leveling, and grading.



loader and dump truck



crowd a bucket to maximise the amount of material that can be lifted

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**QUESTION 30**

What kinds of tests should you do before using a machine for earthmoving?

Test brakes



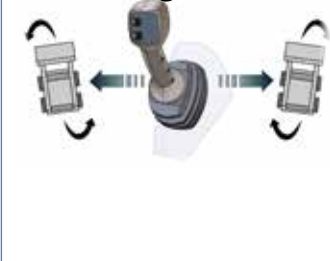
Test attachment movements



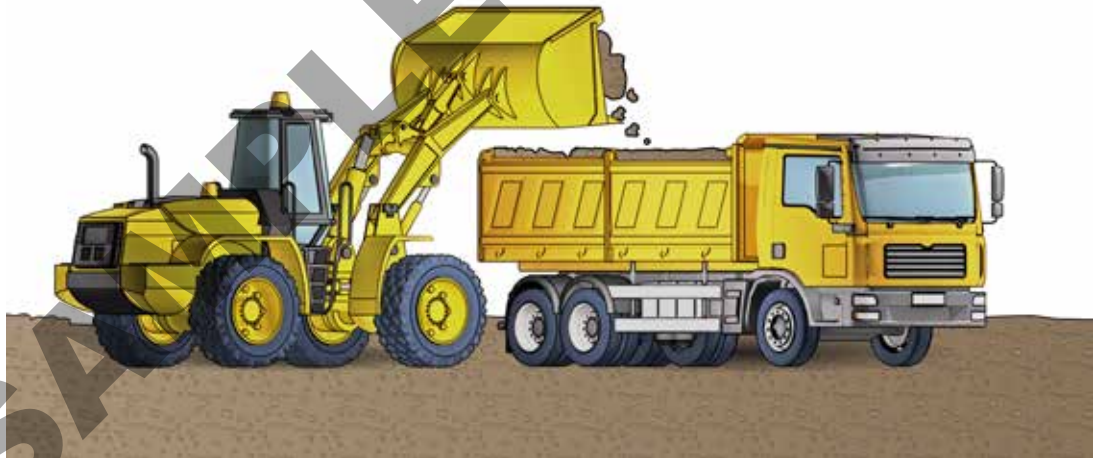
Test controls



Test steering



# Lift, carry and place materials



## Table of weight of common materials

1000 kilograms = 1 tonne

### Examples of the approximate weight of different materials:

1 cubic metre of water = 1 metric tonne

1 cubic metre of earth = 1.9 metric tonnes

1 cubic metre of clay = 1.9 metric tonnes

1 cubic metre of dry beach sand = 2.0 metric tonnes

1 cubic metre of concrete = 2.4 metric tonnes

1 cubic metre of coal ash = .08 (8/10) of a metric tonne

25 bags of cement (40 kg each) = 1 metric tonne

1000 common bricks = 4 metric tonnes

1 cubic metre of steel = 7.3 metric tonnes

1 cubic metre of copper = 9 metric tonnes

1 cubic metre of lead = 11.4 metric tonnes



**QUESTION 47**

How can you find out the weight of a load?

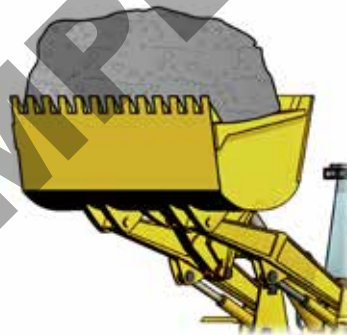
Check the weighbridge note, consignment note, or other information.



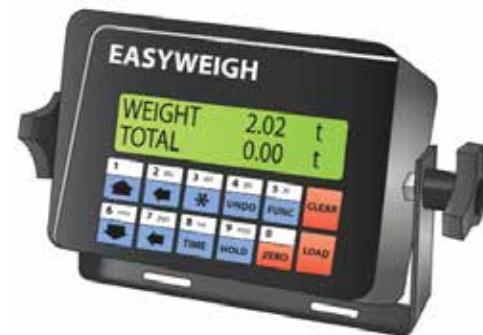
Read the weight marked on the load



Estimate the weight of the load. For example,



Check the machine load scales if it has them fitted.



**QUESTION 48**

You want to use the excavator for lifting.

What must the earthmoving machinery have?

The earthmoving machinery must have an approved lifting lug and the SWL marked on the boom. The lug must be manufacturer approved.

**Do not** use the bucket to lift! If there is a quick-hitch type bucket, take off the bucket first.

**Do not** lift from anything attached by the quick hitch system.

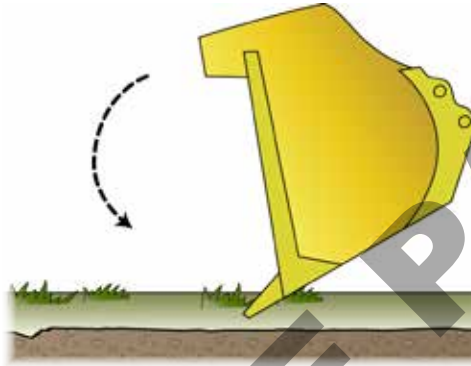


**QUESTION 63**

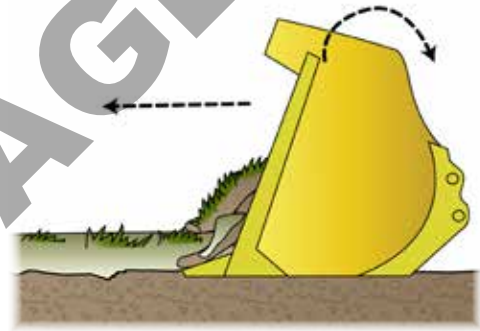
How do you strip topsoil?

Explain the steps.

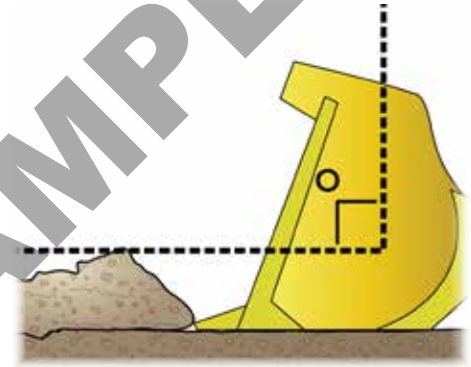
1. Tilt the bucket forward so the front of the cutting edge is in contact with the ground.



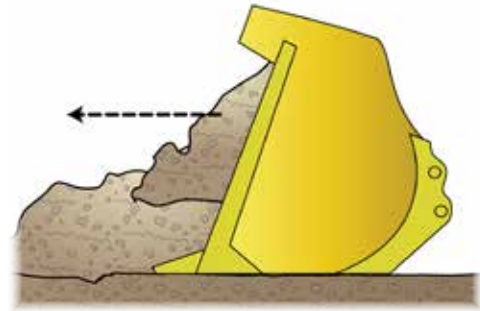
2. Drive forward to dig.



3. Roll the bucket back to level at the correct depth.

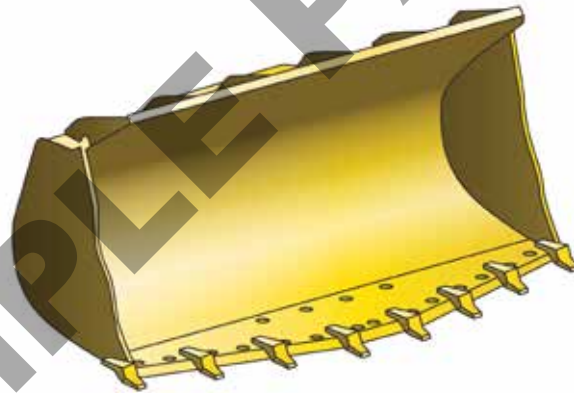


4. Move forward until the bucket is full.



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# Select, remove and fit attachments





**QUESTION 74**

What kinds of buckets can you use on a front end loader / backhoe?

What do you use them for?

**Rock bucket**

This bucket has a straight or spade edge. You use this bucket for moving rocks.



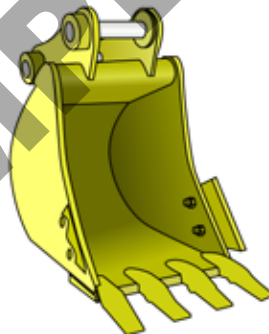
**Multi-purpose bucket (4-in-1)**

This bucket has teeth and a blade. You use this bucket for dozing, clamping, loading, scraping and back blading for levelling.



**Excavating bucket**

This bucket has teeth and is used for general digging.



**Trench bucket**

This bucket is narrower than the excavating bucket and is used to dig trenches suitable for pipe or cable laying.



# Relocate the machine



**QUESTION 96**

A loader is to be transported. How is the preparation done by the person responsible?

Make sure the transport vehicle is wide enough and long enough to fit the loader

Make sure the transport vehicle is clean

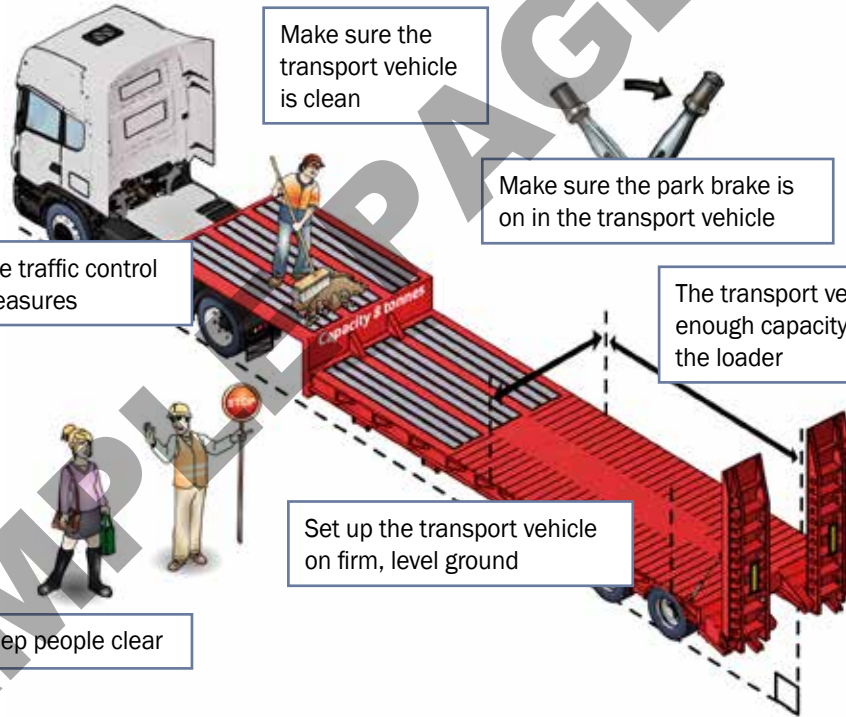
Make sure the park brake is on in the transport vehicle

Use traffic control measures

The transport vehicle has enough capacity to carry the loader

Set up the transport vehicle on firm, level ground

Keep people clear



# Carry out post-operational procedures



**QUESTION 99**

You've finished using earthmoving machinery.

What post-operational checks do you do?

Check for:



# Housekeeping



**QUESTION 109**

After you've finished the job, what should you do?

Tell people who live in the area that the work is finished.



Clean the job site.



Throw away any rubbish and recycle what you can.

