

Nitty Gritty Super City

Education kit

*An Adventure with Science and Technology
for Young Learners*

For teachers, parents and carers of students in Years Prep-3



Acknowledgments

This education kit is based on materials developed by education program coordinators from Museum Victoria.

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Teachers may copy material in this education kit for classroom use.



<http://museumvictoria.com.au/Scienceworks/Education/>

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Teacher notes

Introduction

The exhibition

Explore science in the city! Specifically designed for three to eight year olds, *Nitty Gritty Super City* is a fun and interactive exhibition set in a mini metropolis where children are encouraged to push buttons, pull ropes, investigate materials, and encounter sounds, objects and other people.

The exhibition is divided into 10 sections, each with its own 'city' theme. These themes are all areas that are of great interest to young children – highlights include the construction zone, the role-play café, the digger, the cargo ship and the interactive music bowl.

Science skills and children's play

Research shows that play is one of the major means by which young children learn. Play is essential to every aspect of children's development – social, physical and cognitive. Through play, children have the opportunity to be creative and to transfer this creativity to situations outside their play world. It provides them with the opportunity to explore and test out their own ideas.

The *Nitty Gritty Super City* exhibition forms an excellent backdrop for students to explore, through play, a range of ideas and to develop the science process skills of observation, classification and communication.

Contents of this education kit

- a description of the learning links that happen when children visit the exhibition
- a simple floor plan of the exhibition, showing its 10 sections
- a description of the main exhibits in each exhibition section, to be discussed with your class before and after your visit
- questions and activities for your students during their visit to *Nitty Gritty Super City*
- a range of activities related to the theme of each section for you and your children to do at school or at home
- Ten posters with discussion questions to use with your class before and after the class visit to *Nitty Gritty Super City*. Printed copies will be mailed to school and kinder groups when they book the visit to Scienceworks. PDF files are available at <http://museumvictoria.com.au/Education-Kits> Nitty-Gritty, and may be printed as A3 or A4 size.

Essential preparation for your visit

Research has shown that setting clear objectives for a museum excursion and discussing them with your students is extremely important. It makes the purpose of the visit clear and focuses the students to work together during the visit.

Before the visit:

- Use the posters to discuss the forthcoming excursion, create interest in the exhibition and assess students' knowledge and understanding of what they will see.
- Divide the students into small groups, each of which will be accompanied by a teacher or other carer.
- Photocopy the *Nitty Gritty Super City* map (page 9) and *What to do in Nitty Gritty Super City* (pages 7-8) for each of the teachers and carers that will be accompanying the excursion. These resources provide focus questions and role play ideas for each of the exhibits.

Poster activities

The poster activities provide a framework for a range of playful learning opportunities for young children. A range of skills are promoted, especially those related to communication and language, observation, problem solving, and working with others.

Learning outcomes and discussion questions for use before and after your visit are provided for each poster. [Dr Edward de Bono's Six Thinking Hats](#) may encourage the children to think beyond their immediate answers.

The ten posters relate to the *Nitty Gritty Super City* exhibits listed below. PDF files to download the posters are provided as part of this education kit:

- *Music*
- *Working together*
- *Café*
- *Minibeasts*
- *Clocks*
- *Microscopes*
- *What's it made from?*
- *Tools*
- *Weather*
- *Binoculars*

Learning links

Learning opportunities in the *Nitty Gritty Super City* exhibition, poster activities and education kit relate closely to the Victorian Essential Learning Standards (VELS) and to Gardner's Multiple Intelligences.

Victorian Essential Learning Standards		
Strand	Domain	Dimension
Physical, Personal and Social Learning	Interpersonal Development	Working in teams
Discipline-based Learning	English	Reading Speaking and listening
	Mathematics	Number Working mathematically
	Science	Science knowledge and understanding Science at work
Interdisciplinary Learning	Communication	Listening, viewing and responding
	Thinking processes	Reasoning, processing and inquiry Reflection, evaluation and metacognition

Gardner's Multiple Intelligences							
	Verbal - Linguistic	Logical - Mathematical	Picture - Spatial	Body - Kinesthetic	Music - Auditory	Interpersonal	Intrapersonal
Large format posters							
Microscopes	●	●	●	●		●	●
Working together	●	●	●	●		●	
What's it made from?	●	●	●	●		●	●
Music	●		●	●	●	●	●
Tools	●	●	●	●		●	●
Café	●	●	●	●		●	●
Minibeasts	●	●	●	●		●	●
Weather	●	●	●	●		●	●
Clock	●	●	●	●		●	●
Binoculars	●	●	●	●		●	●

The broad activities and resources listed below relate to at least one of the VELS domains of Science, Thinking skills or Interpersonal development.

Science activities for younger children are available from many websites. Many require some adult supervision and assistance.

Cool Science: <http://www.hhmi.org/coolscience/>

How stuff works: <http://www.howstuffworks.com/>

Exploratorium Snackbook: <http://www.exploratorium.edu/snacks/>

Science fun: <http://www.funology.com/>

Museum science centres: <http://www-2.cs.cmu.edu/~mwm/sci.html>

Thinking skills can be encouraged by engaging in games, puzzles and problem solving with your children. Asking questions, discussing and suggesting solutions to problems are important. Here are some examples; Google search 'Children's puzzles' for lots more!

Puzzles and games: <http://www.thekidzpage.com/index.html>

Paper aeroplanes: <http://www.exploratorium.edu/exploring/paper/airplanes.html>

Simple origami: <http://www.origami-instructions.com/>

Interpersonal development occurs when children play and work together with others. Children should experience being part of a pair, part of a group of three or four, and part of a class. They could prepare a poster together, write and perform a short play with dress ups, or build a bridge or tower out of milk cartons or LEGO. They could organise a tea party, and, in small groups, prepare food to share. Then take turns to wait on the tables and pass food to each other. Google search 'Children's group activities' for more.

What to do in Nitty Gritty Super City

Focus children's attention by engaging with them as they explore the areas in the exhibition. Try role-playing, assisting with exhibits, discussing what is happening and making links with home.

Build it

Choose the right tool	Point out that the shape of the tools matches the shapes of the nuts and screws. Which way do you turn the tool to make the screw come out of the wall?
Build an arch bridge	Use the bridge supports to put the pieces together. Make sure that the wedge-shaped pieces are pointy side down. Remove the supports and walk over the bridge. Point out that the wedge-shaped pieces hold arch bridges together.
Build a sculpture	Encourage the children to be creative!
Lift the bucket	Point out the pulleys, and that the buckets all have the same weight. Count the turns of rope around each pulley. Which pulley system makes it easiest to lift the bucket? The pulley system with the most turns is easiest to pull, but you have to pull it the furthest.
Lift a pile of bricks	Try to lift the bricks by pulling on the two ropes. Point out the pivot point of the lever, and that the rope that is furthest away from the pivot point is easier to use. However, you have to pull it further.
Build a wall	Get your children to try all the equipment. Encourage them to take turns and co-operate with others to move the bricks. Count the bricks as they are moved.
Drive the digger	The children sit in the operator's seat to move the digger's arms and scoop to pick up some balls. Press the yellow button to obtain power.

Get around

Move that cargo – <i>Little Yarra</i>	Encourage your children to co-operate and take turns. Discuss the shape and contents of the cargo containers.
Wheel and rudder – <i>Little Yarra</i>	Use the boat's steering wheel. Trace the red cable from the steering wheel to the rudder.
Hoist a flag – <i>Little Yarra</i>	Discuss what some of the shipping flags mean.
Inspect the cargo	Discuss the shapes of the ships. Lift the flaps to see their cargoes. Talk about why ships are used to transport cargo.
Penny farthing bike	Encourage your child to sit on the bike. How does it compare with modern bikes? Why is it called a 'Penny farthing'?

Look out

View of the Westgate Bridge	Watch the traffic going over the bridge. Discuss what the trucks are carrying, and where they are going. Count the number of trucks crossing the bridge.
Other bridges	Discuss the different sorts of bridges in the pictures on the wall.
Spot the difference	Compare the large mural with what you see outside.

Melbourne model

Large model of Melbourne's CBD and inner city	Look at the detail together. Find buildings that your children might recognise, miniature people, plants, animals and vehicles of various kinds. Press the yellow buttons to turn on down-lights that highlight major features.
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Town hall clock

The clock tower has digital and analogue clocks.	If your children are learning to tell the time, get them to use the two clocks to show the same times. Match digital times with regular activities such as meal times and bed times.
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Recyclatron

In general.....	Point out that we recycle so that useful things, like cans, bottles and paper, aren't wasted, but are saved to be made into new things. Discuss recycling in your home or school.
Magnet sorter	Turn the wheel. The big round magnet picks up steel cans, but not paper and plastic. Watch the video.
Big and small	Turn the wheel to allow little things to fall through the holes, and paper to remain. Watch the video.
Air blower	Press the button to blow plastic and paper objects into the box. Heavy glass objects remain. Watch the video.

Music bowl

Join the band	Compare the sounds of instruments made of wood, steel, bamboo or brass. Encourage children to notice how different sized instruments make low and high notes. Touch the bells while they are ringing. What do you notice?
Mirrors	Look at your image in the mirrors and have a good laugh!

Café

Café kitchen and counter	Have your children take turns at being counter staff, waiters and customers. Ask your children to describe the menu and prepare a meal for you.
Pianola	Point out the holes in the paper roll that create the music.
What is it made from?	Lift the flaps to discover where our food comes from. Which ones did your children already know, and which ones were surprises? Which foods come from animals and which come from plants?
Advertisements	Discuss the old-fashioned food advertisements. Which foods are advertised now, and where are they advertised? (television, magazines)

Creatures

Animal evidence: Who has been here?	Help the children to identify the tracks and traces left behind by the animals. Which animals do the children know? Where do they live? What do they eat?
Night sounds	Press the buttons and listen. What other animal sounds might you hear at night?
Mini-beasts	Slide the magnifier to match the giant model with one of the three real specimens. Discuss which features are the same and which are different.
Bird spotting in Melbourne	Which birds do your children recognise? Point out the nests, eggs, male/female and introduced/native birds.
Microscopic view	Help the children to use the microscopes and identify what they are looking at.
Log crawl through	Children only for this one (!)

Weather station

Make a weather report	Encourage your children to take a seat, press a button and spend two minutes answering simple recorded questions about the weather. View their recorded 'weather report' afterwards on the other side of the pillar.
Make a weather story	Discuss the weather being represented in each part of the mural. Match the cut-out clothes to the weather. Make up a story about the people in the mural.
Weather sayings	Are any of these sayings familiar to your children? What do they mean?
How we measure weather	Tell the children what each group of instruments is for.

Exhibition floor plan

Nitty Gritty Super City is divided into 10 sections. The large format posters relate to particular exhibits in these sections as indicated in the table below:

Exhibition sections	Large format posters
1. Build it	<i>Working together</i> <i>Tools</i>
2. Get around	<i>Working together</i>
3. Look out	<i>Binoculars</i>
4. Melbourne model	
5. Town hall clock	<i>Clocks</i>
6. Recyclatron	
7. Music bowl	<i>Music</i>
8. Café	<i>Café</i> <i>What's it made from?</i>
9. Creatures	<i>Microscopes</i> <i>Minibeasts</i>
10. Weather station	<i>Weather</i>



Exhibition sections

The pages that follow describe each of the 10 sections of *Nitty Gritty Super City*. Thumbnail images for the posters that relate to exhibits in each section are also provided.

1. Build it

Have you been in a tall city building?

Maybe you have seen some being built.

Construction workers use machines and tools to build the city.

Exhibits

- Choose the right tool
- Build an arch bridge
- Build a sculpture
- Lift the bucket
- Lift a pile of bricks
- Build a wall
- Drive the digger

Posters

The following posters refer to exhibits in this section of the exhibition:



Tools



Working together

2. Get around

How did you travel to Scienceworks today?

You may have come by car, bus, train, boat or even an aeroplane.

Cities have many ways to transport people and supplies.

Exhibits

- Move that cargo – *Little Yarra*
- Wheel and rudder – *Little Yarra*
- Hoist a flag – *Little Yarra*
- Inspect the cargo
- Penny farthing bike

Posters

The following poster refers to an exhibit in this section of the exhibition:



Working together

3. Look out

Exhibits

- View of the Westgate Bridge
- Other bridges
- Spot the difference

Posters

The following poster refers to an exhibit in this section of the exhibition:



Binoculars

4. Melbourne model

Living in the city can be wonderful – there’s so much to see and do!

The better we know our city, the more we can enjoy it.

What do you enjoy about the city?

Exhibits

- A large LEGO model of Melbourne’s CBD and inner bayside suburbs

5. Town hall clock

Exhibits

- The Town hall clock tower has a large clock with a face and hands and a smaller digital clock

Posters

The following poster refers to an exhibit in this section of the exhibition:



Clocks

6. Recyclatron

Exhibits

- Screen 1: What can be recycled?
- Screen 2: Inside the recycling factory
- Screen 3: Magnets remove steel
- Screen 4: Sorting small from big (paper)
- Screen 5: Air sorts light from heavy (plastic bottles and aluminium cans)
- Screen 6: Recycling is useful!

7. Music bowl

*Can you sing, dance or play a musical instrument?
You may have been to a concert in the city.
Cities have lots of entertainment to enjoy.*

Exhibits

- Join the band: Children try all the instruments and make music – glockenspiels, a thongs-a-phone, chimes, a triangle, bells and a washboard.

Posters

The following poster refers to this section of the exhibition:



Music

8. Café

*What will you order at the café?
Some people have a favourite café that they like to visit.
You can find many different types of food in the restaurants and cafes of the city.*

Exhibits

- A café with kitchen and counter
- A pianola
- 'What is it made from?' lift-the-flap exhibit
- 1960s food advertising posters

Posters

There are three posters that refer to this section of the exhibition:



What's it made from?



Café



9. Creatures

Have you seen any wildlife today?

Maybe you've seen or heard the animals that live near your home.

We share our cities with many different native and introduced animals.

Exhibits

- Animal evidence: Who has been here?
- Night sounds
- Microscopic view
- Log crawl-through
- Bird spotting in Melbourne
- Mini-beasts

Posters

The following posters refer to this section of the exhibition:



Microscopes



Minibeasts

10. Weather station

Exhibits

- Make a weather report
- Make a weather story
- Weather sayings
- How we measure weather

Posters

The following poster refers to this section of the exhibition:



Weather

Activities for school or home

The following activities are suggested as ways of continuing the learning and fun of the exhibition at school or home. The activities are listed under the exhibition section that they relate to.

1. Build it

- **Construction corner**

Collect matchboxes, other small boxes, drinking straws, icy-pole sticks, string, wool, coloured paper, cardboard, etc. Provide clag, PVA glue, scissors and stapler, and encourage the children to construct a building of some sort. Encourage them to form pairs and talk about their plans before they start.

- **Simple machines**

Collect examples or pictures of common simple machines. Hold up each object or picture in turn, discuss its purpose and how it works and try to identify what type of simple machine it is. Allow the children to operate each machine if it is safe to do so.

Simple Machine	Example
Pulley	Flag on flagpole
Wheel and axle	Bicycle wheels, door knob
Gear	Cogs inside clock
Lever	Broom, door, lid on toilet, stapler, wheelbarrow, spanner, nut cracker
Inclined plane	Ramp, windscreen on car, staircase
Screw	Light globe with screw end, screw and screwdriver, lid on jar
Wedge	Knife, nail, drawing pin

Learn more about simple machines by visiting: <http://www.edheads.org/activities/simple-machines/>

- **Visit a works site**

Find a road construction site, a house under construction or a high-rise building under construction in Melbourne's CBD. Try to organise a visit during working hours. Discuss what's happening and the machinery being used with your children.

2. Get around

- **Shipping flags**

Make some international shipping flags with paper and crayons. Exchange simple messages with a friend in a nearby play boat.

International signalling flags:

http://en.wikipedia.org/wiki/International_maritime_signal_flags

- **Road signs card game**

Draw, or print out and colour in, about 25 common road signs on pieces of card. Write one or two words to describe what each card means on about 25 separate pieces of card.

Shuffle all the cards together, and deal them all out evenly to the players.

Players match each sign card with its meaning card, and lay them out in pairs.

Now take turns to discard one of the remaining cards at a time face up in a pile in the middle of the table. Each player can pick up the top card if they wish and then discard one card from their hand.

The player who gets rid of all their cards first by laying down correct matching pairs is the winner.

Alternatively, the adult holds up one of the sign cards. The children take turns at having the first try to say what the sign means. If they are wrong or don't know, everyone else can try (hands up!). The child who gives the correct meaning gets the sign card. The child who accumulates most sign cards is the winner.

Road and rail signs: <http://www.hobbiesplus.com.au/signspotters/>

- **Port of Melbourne**

Take a free excursion to the Port of Melbourne. Contact the Education Centre, 343-383 Lorimer Street, Port Melbourne, 3207, Telephone: 9645 3000.

<http://www.portofmelbourne.com/>

Check this website for details of shipping movements. The arrival or departure of a cruise ship, usually from Station Pier, is an exciting excursion.

- **Transport long ago**

Use magazines, or the Internet to obtain pictures of modern forms of transport, and transport 'in the olden days'. Have your children choose one form of transport, and use pictures and simple information to make a poster for presentation to the group. Alternatively, make a large class mural, with sections for each form of transport.

Forms of transport could include bicycles, cars, trains, aeroplanes and ships. Horse-drawn carriages could also be looked at as predecessors of all forms of land transport.

- **Where does it come from?**

Look in your cupboards at home to find things that have come to Australia as cargo from overseas. Make a list of these, and find where the countries are in a children's atlas. Try to trace the route that the ship might have taken to get to Australia.

3. Look out

- **Different sorts of bridges**

Find some pictures of different sorts of bridges.

You could start by checking your library or doing a google search.

The website of the Matsuo Bridge Co. has nice illustrations and images for six basic bridge types:

<http://www.matsuo-bridge.co.jp/english/bridges/index.shtml>

Or start with Australian bridges on Wikipedia:

http://en.wikipedia.org/wiki/Category:Images_of_bridges_in_Australia

Discuss with your children the purposes of bridges and how they are constructed.

Get them to draw a bridge. How is it held up?

What uses the bridge? It could be for pedestrians, cars and trucks, cattle, trains, pipes, or even taxiing aircraft (Sydney airport)!

What goes under the bridge? It could be for crossing a river, some sea, a road or a railway line.

- **Make a bridge**

Build a bridge for some toy cars.

Get together a variety of building materials, e.g. straws, cardboard, paper, icy pole sticks, matches, string, Bluetak.

Start with a simple bridge over a small 'river' a few centimetres off the floor or table. Try a bridge with piers and then a single span bridge.

Push two tables close together, and make a single span bridge across the gap.

Widen the gap and see if you can make a bridge that doesn't collapse when a car crosses it.

5. Spot the difference

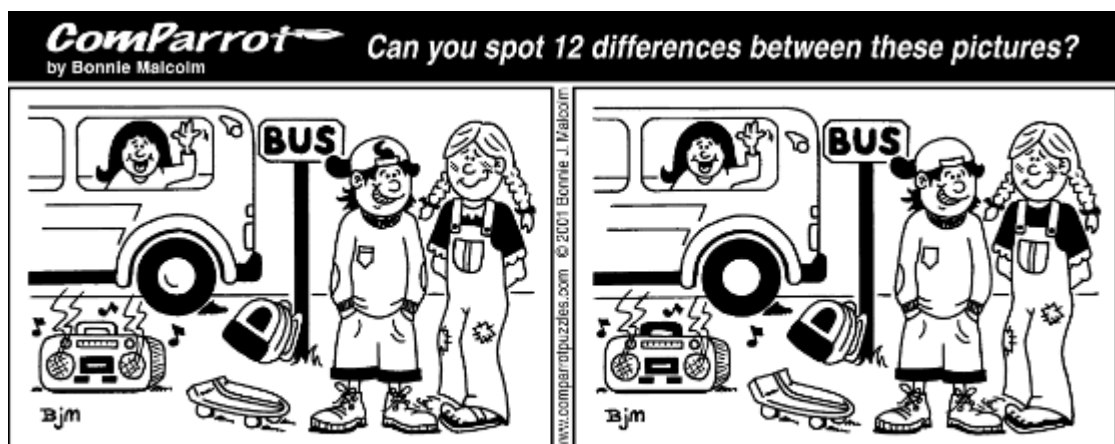
There is a Westgate Bridge 'Spot the Difference' puzzle in the Look Out.

Children love to do these puzzles, and are often very good at them. They are an excellent way to develop observation skills and an attention to detail.

Download some from the Internet, or buy a book of puzzles at your newsagent.

Older children can then make puzzles of their own for each other.

<http://www.comparrotpuzzles.com/>



Solution: 1. Line on boy's pocket missing. 2. Strap on sandal missing. 3. Hair at back of ball cap missing. 4. Elbow patch missing. 5. Back of seat by girl's arm missing. 6. Hub cap missing. 7. Collar on girl's top colored in. 8. Boom box handle colored in. 9. Patch on pants moved up. 10. Light on bus moved down. 11. Musical note moved to right. 12. Back of skateboard is longer.

4. Melbourne model

- **Our Neighbourhood**

Use a digital camera to take photographs of the main buildings, shops and parks in your neighbourhood. Put these into a slide show or PowerPoint presentation. Include a sentence or two to describe each image.

- **Image search**

Search for online images of well-known buildings in Melbourne. View and discuss them with your students/children. Try to involve everyone in the discussion. What is this building? What happens inside? Which children have visited it? e.g. Travel Victoria: <http://www.travelvictoria.com.au/regions/melbourne/city/>

- **Online maps and satellite images**

Use Google Maps and Google Earth to focus on your neighbourhood:

<http://maps.google.com.au/maps>

<http://earth.google.com/>

Can you see your house, school, local shops, park?

Use these websites to look at Melbourne's CBD. What are the names of the main streets? Can you find some of the well-known buildings that are in the model in *Nitty Gritty Super City*?

- **Excursions**

Take your children for an excursion to some of the buildings and other features in your neighbourhood that you have discussed. Use maps and images to discuss where you will go and what you will do before you leave, and to trace where you went after you return.

Take your children on an excursion to Melbourne City. Plan carefully, make sure that you have sufficient adult helpers, and don't try to focus on more than two or three features. Be clear on where to have lunch, and where to find toilets. Use maps and images for discussion before and after your excursion.

- **Make a village**

Draw a map of a small village on a large piece of thick paper. Decide on what to include with your children, e.g. the names of the main streets, the path of the railway line, the location of the playground, whether there is a river/creek/duck pond, whether the land is flat, with straight streets, or hilly, with windy streets. Draw these on the map.

Allow each child to build one building to be placed on the map, using blocks, washed out milk cartons or LEGO. Discuss whether the buildings should be located on the main shopping street or elsewhere. Include some houses, the baker's shop, the supermarket, the petrol station, the railway station. Obtain some model cars and a model train, and place these in your village.

Alternatively, the children could each draw a building and other features on the map.

5. Town hall clock

- **Mister Wolf**

Play 'What's the time, Mister Wolf?' which is a lot of fun, but also introduces the concept of telling time by numbers.

The children in a group repeatedly ask 'Mister Wolf' the time, while slowly walking towards him. 'Mister Wolf' answers, 'Two o'clock' etc. for a while, until he suddenly answers, 'Dinner time!' and chases the children. If he catches a child, that child is out of the game.

- **Clock play**

Obtain a large, old clock with face and hands and an old digital clock. Allow the children to play with them by moving the hands or numbers to show different times.

If your children can read numbers, nominate various times for them to show on the clocks. Begin with 'o'clocks', then introduce half-past, quarter-past, and quarter-to the hour.

- **Make a clock**

Help the children to make a clock, with a face with numbers and two moveable hands held in place with a split pin. Have the children decorate their clocks, and then use them to provide practice in telling the time.

Alternatively, buy a clock face stamp and prepare work sheets for the children to use to show times. Make sure it is fun, and allow the children to colour the clocks' numbers, etc.



6. Recyclatron

Brainstorm/discuss: Why should we recycle?

Recycling saves energy, water, raw materials and greenhouse gases. If a plastic factory can make things from recycled plastic, it doesn't have to start all over again and use oil to make plastic. And if a glass factory can use recycled glass to make bottles, it doesn't have to make the glass from sand.

Recycling also keeps the city tidy and stops our rubbish tips from overflowing.

List and discuss: What does your family/school recycle?

What sorts of things does your school/family recycle?

What other things should go into the recycle bin?

Make a list of things that should go into the rubbish bin instead of the recycle bin (e.g. food scraps, garden waste, bricks, dog droppings.....).

What problems do these things cause at the recycling factory if people get their bins mixed up?

Sorting activities

- Set up a box of mixed objects for children to sort. Choose the objects carefully, so that they can be sorted according to different criteria. The children should nominate how they will sort the objects, and then put them into piles on a table. Labels could be prepared for each pile before sorting starts, and then adjusted as necessary while sorting proceeds.

Suggested categories for sorting a collection of objects several times:

Colour	Value
Size	Name
Material	Purpose

Drag a magnet through your collection of objects. Which objects will the magnet pick up? What are these objects made from? (steel)

- Make a list of different types of books (stories, information, how to do things, books to write in, books for adults, books for children.....).
Now make a list of the subjects covered by books (animals, cookery, famous people, foreign countries, history, science).
Tour your library. Ask the librarian to show you around and describe how the books in the library are classified (the Dewey cataloguing system).
- Put together a 'Hardware Shop' collection of nails, nuts, bolts, screws, washers, etc. Ask the children to sort them according to type, and then to further sort each of these types according to size.
- Discuss and list the various sections of a supermarket. Write down as many items as you can under each section. Where do yoghurt, apples, cornflakes, toilet paper, shampoo, jam, biscuits, spaghetti, etc. belong?
- Play *Animal, Vegetable, Mineral*
A child thinks of an object. Other children have to work out what it is by asking questions of the first child, who can answer only yes or no. It will become clear that it is best to start with broad questions and then narrow the focus, e.g. *Is it an animal?* should be asked before *Does it have legs?*
- Make a poster to encourage recycling in your school or community.

7. Music bowl

Make the instruments below and form an orchestra!

- **Mailing Tube Whackers**

Whack the ends of mailing tubes of various sizes with a rubber thong to produce sounds of different pitch.

Put a lid on one end of a tube. The sound is now an octave lower than when both ends of the tube were open.

Arrange the mailing tubes, with and without lids, from lowest pitch to highest pitch. Can you play a simple tune?

- **PVC Pipe Whackers**

Whack the ends of pieces of PVC pipe of various lengths with the rubber thong. Short pipes make high sounds, while long pipes make low sounds.

Arrange the pieces of pipe from lowest pitch to highest pitch. Play a simple tune.

- **Singing Wine Glasses**

Place eight wine glasses in a row on a table. Put some water in each wine glass. Put very little water in the left hand glass, a little more in the next one, and so on.

Show the children how to wet a finger and run it around the rim of each glass to make it 'sing'. Adjust the amount of water in each glass to make the eight notes of an octave. Lots of water will decrease the amount of the glass that vibrates, thereby producing a sound of higher pitch.

- **Ruler Guitar**

Hold a ruler on a table with half its length over the edge. Pluck the end of the ruler and listen to the sound.

Vary the length of ruler that is over the edge of the table. A short length will make a higher sound; a long length will make a lower sound.

- **Rubber Band Guitar**

Cut a hole in the middle of a shoe box. Stretch several rubber bands of various lengths and thicknesses across the top of the box. Leave a gap of about 1cm between each rubber band.

Make a bridge by inserting two wooden sticks about 1.5cm square under the rubber bands on each side of the hole in the box.

Now play your guitar by plucking the rubber bands singly or together.

Source: <http://www.iit.edu/~smile/ph9301.html>

8. Cafe

- **Let's play 'shop'**

Set up a counter and a collection of things for sale. Discuss how much each item costs, and put price labels on them.

Take turns at being customers, waiters and kitchen staff. Use play money or real money – single coin transactions for younger children, and transactions involving change for older children. Don't forget 'please' and 'thankyou'!

You could also arrange a 'delivery' of extra items for the shop to sell. Discuss the origin of these items, how much the shopkeeper pays for them, and how much extra he/she sells them for.

- **Visit a café**

Take your children to a child-friendly café. Pay particular attention to the menu, the kitchen if you can see it, and the work that the waiters are doing.

When you return to home or school, discuss what you have seen.

What food was available? How was it different from the food you have at home?

What were the duties of the waiters and the other people working in the café?

What was good about the café, and what could have been improved?

Set up a play café at home or school. Obtain some play food crockery and utensils, work out who will be customers and who will be the waiter and the cook. Older children may be able to prepare some real food with your supervision, although you will need to be careful about hygiene.

- **Cookery class**

Encourage the children to try some simple food preparation. Start with sandwiches, and progress to baking biscuits. Close supervision of knives and hot stoves is, of course, essential! You could set up a playground or neighbourhood stall to sell what has been produced.

There are many children's cook books – for example:

Watt, F., *Cakes and Cookies for Beginners*, Usborne Publishing, London, 1998.

Australian Women's Weekly, *Kids in the Kitchen*, ACP Publishing, Sydney, 2006.

- **What is it made from?**

Discuss the origins of the various foods in the lift-the-flap exhibit in the café.

Make a list of other common or favourite foods and discuss where these foods come from. You may need to consider how, and to what extent, you will discuss the origin of meat.

Foods to consider could include: rice, spaghetti, bread, butter, fruits, carrots and potatoes (below ground), and beans and broccoli (above ground).

You could also consider the ingredients in manufactured foods. Food labels provide a range of useful information, including amounts of fat and sugar.

- **Food advertising**

Discuss the old-fashioned food advertising posters that were on the wall in the Nitty Gritty café. What modern food advertisements have the children seen?

Make a collection of food advertisements from magazines and newspapers. List those that they know from television. Which advertisements are for healthy food and which advertisements are for 'junk food'?

Discuss what is wrong with 'junk food' and why it is not good to eat it very often.

Food pyramid: <http://www.kidskonnnect.com/content/view/336/27/>

9. Creatures

- **Tracks and traces**

Go on a field trip with your children to an area where you are likely to find tracks and traces made by 'mini-beasts' or other animals. This could be in your back garden, school ground or nearby park. Look for undisturbed sandy or loamy areas, particularly after rain. You may find tracks made by birds, snails, worms, beetles, or, if you are lucky, a larger animal. Collect feathers, and insect and spider sloughs (outer skins discarded as they grow).

- **Making tracks**

Download the animal tracks worksheets from the Parks Victoria education pages at: http://www.parkweb.vic.gov.au/education/park_natives/ad8-btm.cfm or consult: Barbara Triggs, *Tracks, Scats and Other Traces: A Field Guide to Australian Mammals*, Oxford University Press, South Melbourne, 1996. Cut potatoes in half and carefully make relief stamps of several animal footprints. Provide the children with the potato stamps, large pieces of paper and paint for them to produce their own trackways. Write the name of the animal alongside its tracks, and have the children draw or paste a picture of the animal nearby.

- **Birdwatch**

Make a list of the birds of your school ground, home garden or park. Have your children choose a favourite bird and gather some information about it. They could also practise mimicking its call, which could enable your class or group to present its own 'dawn chorus' to an audience. Information, images and calls for many common Australian birds can be found on the following websites: Birds Australia's 'Birds in Backyards': <http://www.birdsinbackyards.net/> ABC's 'Backyard Birdwatch': <http://www2.abc.net.au/science/birds/asp/index.asp>

- **Insect zoo**

Collect some insects and other minibeasts from the schoolground or backyard, being careful not to touch those that sting or bite. The shop at Scienceworks sells 'bug catchers' to help with the hunt. Use the 'Classification' page of Museum Victoria's Bugs website for help with identification: <http://www.museum.vic.gov.au/bugs/resources/classification.aspx> Gather some information about each creature, make a drawing or photograph, and release it where it was found. The education section of the Bugs website describes a variety of 'minibeast' activities for children, including how to keep some species as 'pets'. Visit the *Bugs Alive* exhibition at Melbourne Museum, which has over 100 species of live insects and spiders on display.

- **Under the microscope**

Collect plants and insects to look at with magnifying glasses and microscopes. Show the children some of the amazing microscopy images on the web, e.g: <http://www5.pbrc.hawaii.edu/microangela/> or choose from the sites listed at: <http://swehsc.pharmacy.arizona.edu/exppath/micro/edu/imagesites.html>

- **Australian animals websites**

For data and images of the mammals, lizards, frogs, snakes and butterflies of Victoria: <http://museumvictoria.com.au/bioinformatics/> (Museum Victoria). For an illustrated *ABC of Australian Wildlife*: <http://www.viridans.com.au/> (Viridians Biological Databases).

10. Weather station

- **Weather calendar**

Make a calendar with a page for each month. Illustrate each month with children playing outdoors in typical weather conditions. Emphasise appropriate clothing and include the Slip, Slop Slap message for September through to April.

- **Make a simple rain gauge**

There are lots of instructions on the Internet showing how to make simple rain gauges. Younger children will need assistance, especially with cutting and measuring.

Gold Coast Water's website provides instructions in how to make a rain gauge with a 2 litre plastic soft drink bottle (go to page 24):

http://www.goldcoastwater.com.au/attachment/goldcoastwater/Education_Primary_pt5_Activity_Sheets.pdf

For areas that receive only a few millimetres of rain in each downpour (like Melbourne), it is a good idea to make a rain gauge that magnifies the scale of measurements on the side of the bottle. It is then much easier to measure smaller amounts of rain.

What you need

An empty glass jar, with straight sides

A plastic kitchen funnel, somewhat wider than the jar

Masking tape for marking measurements

What to do

1. Measure the area of the top of the funnel and the area of the bottom of the jar for your children.
Work out how many times larger the area of the top of the funnel is compared with the area of the bottom of the jar. (Ideally 4 or 5 times is best, so choose your jar and funnel with this ratio in mind).
2. Mark a scale of measurements in millimetres on the masking tape, magnifying the scale according to the ratio calculated above. If, for example, the area of your funnel is 4 times larger than the area of your jar, mark the first millimetre on your scale of measurements 4 mm up from the bottom of the jar. Mark the second millimetre on your scale 8 mm up from the bottom of the jar, and so on.
3. Stick the masking tape to the outside of the jar (0 mm at the bottom of the jar). Cover the masking tape with clear tape so that it is waterproof.
4. Secure the funnel in the top of the jar with two pieces of masking tape, so that it can be easily removed to empty the jar.

- **Make your own weather station**

Instructions for making a simple weather vane, hygrometer and barometer are available from the Franklin Institute website: <http://www.fi.edu/weather/todo/>

- **Weather songs and activities**

ABC's Playschool: <http://www.abc.net.au/children/play/series/series147.html>

BBC's CBeebies: <http://www.bbc.co.uk/cbeebies/somethingspecial/songs/weather.shtml>

Weather Wiz Kids: <http://www.weatherwizkids.com/index.htm>