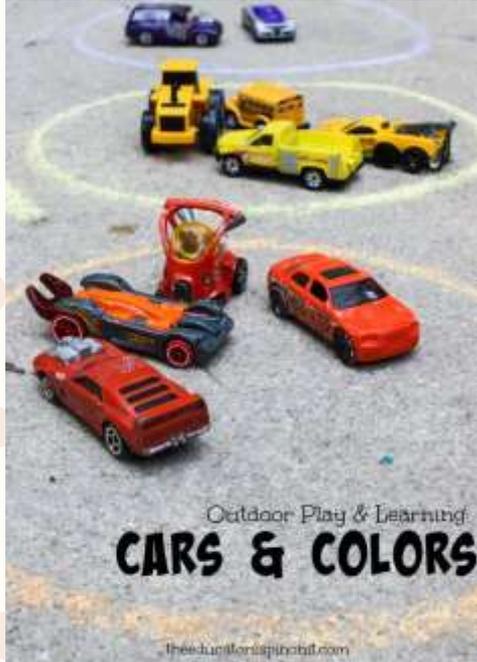# What is Data Handling?

– Data Handling is a crucial aspect of mathematics which relates to collecting, representing and analysing data in order to solve a particular problem or question (Montague-Smith & Price, 2012; Reys, Lindquist, Lambdin, Smith, Rogers, Falle, Frid & Bennett, 2012).

– Data handling allows children to make sense of information, to identify patterns and trends and to predict and plan for the future (Griffiths, 2001).

Why Data Handling?

– Young children experience sorting data from a very early age, for example sorting their toys into categories such as blocks and cars, sorting by colour.

– Connecting the topic of data handling to student's everyday lives makes students' learning more relevant and enjoyable for them as they can see the connections and benefits of having their learning linked to skills they are already familiar with.

Interdisciplinary and Cross Curricula Approach

– Data handling can be easily integrated into all subject areas across the curriculum allowing for a full learning experience (Reys et al, 2012) For example integration with Science, PE and Languages.

– Teaching using a cross curriculum approach is suitable for early years' education as having structured learning times for each subject area can be too demanding on young children.

– An example – year one students using graphs in literacy to keep track of numbers and books they have read. Not only can this topic be applied to other subjects, data handling can be used in multiple mathematical topics, such as money, number work, calculations.

Maths and English

Learning Outcomes	Notes
PRINT CONVENTIONS	
1.3.1 Begin to demonstrate knowledge of print conventions	*Rules that govern the customary use of print in literacy*
❖ Demonstrate correct spacing of letters and words	
❖ Demonstrate correct directionality	*Start to write at the top left side of page, move to right, continue down the page, and know where to go on the following page*

Learning Outcome: 4) Children who are effective communicators

Related Achievements: Children who are aware of different language systems, notably L1 and L2

1   I am fluent in L1. I use full sentences and a wide range of vocabulary.

2   I can repeat key words, phrases or refrains in L2.

3   I can use my repertoire of vocabulary in speech and can talk about familiar themes/contexts using full sentences in L2.

4   I can use multimodal resources e.g. sound, image, digital technology, etc. to extend my language skills.

Maths and PE

Races

Mastery with Greater Depth

Four children played racing games at break time. Each time they won a game they took a counter.

Sam	
Tom	
Sally	
Ally	

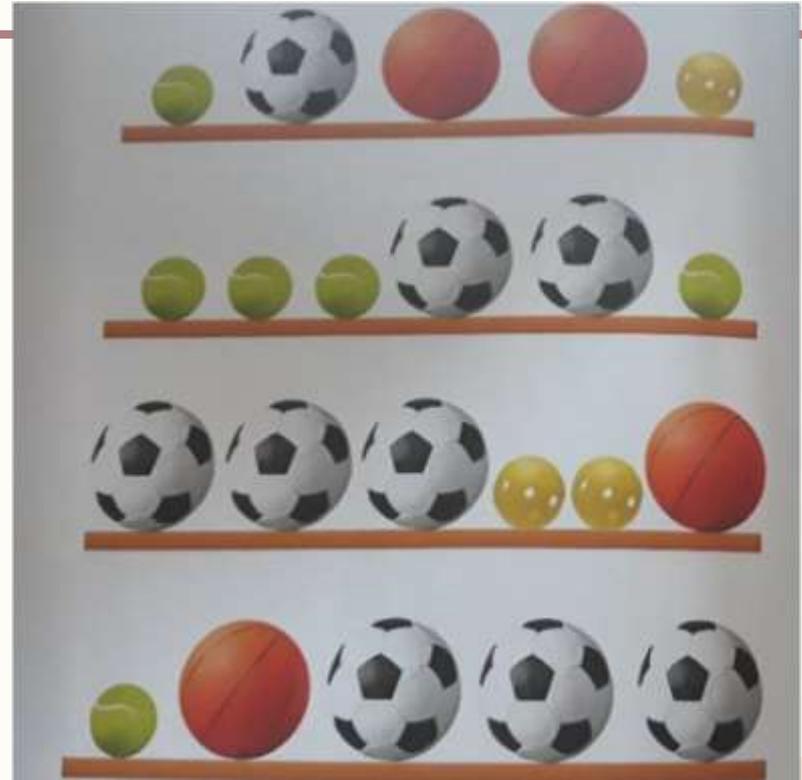Present the information in a different way to make it clearer and answer the following questions:

Who won the most races?

How many more races did Ally win than Sally?

Does the information answer the question:

Who is the fastest runner?

Throwing

PE Syllabus

Athletic Activities

Learning Outcomes

Stage 1: End of Year 2	Stage 2: End of Year 4	Stage 3: End of Year 6
Discovery of Running Jumping & Throwing.	Discovery of Running, Jumping and Throwing Acquisition of basic skills.	Optimization of Running Jumping and Throwing.

Stage 1: end of year 2 – this is covered in FUNdamentals

Learning Outcome: 1) Children who develop a strong sense of identity.

Related Achievements: Children who develop a sense of independence and autonomy.

1] I can manage my physical wellbeing and demonstrate self-care skills in the school setting *e.g. eat my lunch, washing my hands, collect my belongings before going home etc.*
2] I seek opportunities to test and further my abilities.
3] I seek opportunities to use my body's potential.
4] I can undertake simple projects and ask for assistance when required.
5] I am confident in taking a leading role and support others with consideration, courtesy and good manners within my group.
6] I am able to make every day choices.

Learning Outcome: 1) Children who develop a strong sense of identity

Related Achievements: Children who become responsible and resilient in the face of challenges.

4] I know where to seek help when I encounter bullying.

Learning Outcome: 2) Children who have a positive self-image.

Related Achievements: Children who believe in themselves fully aware of their potential and capabilities.

1] I manage myself well within the rules in my setting *e.g. respecting rules, offering support and encouragement etc.*

Maths and Science

Science Syllabus

Sharing Our World : 1.1 Other Animals and Us

Learning Outcomes	Notes
1.1.1 Know that there is a variety of living things.	• identify a living thing from a non-living thing. • know that living things include different types of animals (including humans) and plants.
1.1.2 Recognize different parts of the human body.	• identify and label the names of the basic parts of the human body eg. head, hands.
1.1.3 Know about the five senses.	• name and match actions which humans can do with different parts of the body eg. use hands to throw a ball, to clap, to write…. • name the five senses: sight, touch, hearing, smelling and taste. match the senses to the sense organ eg. sight – eyes …
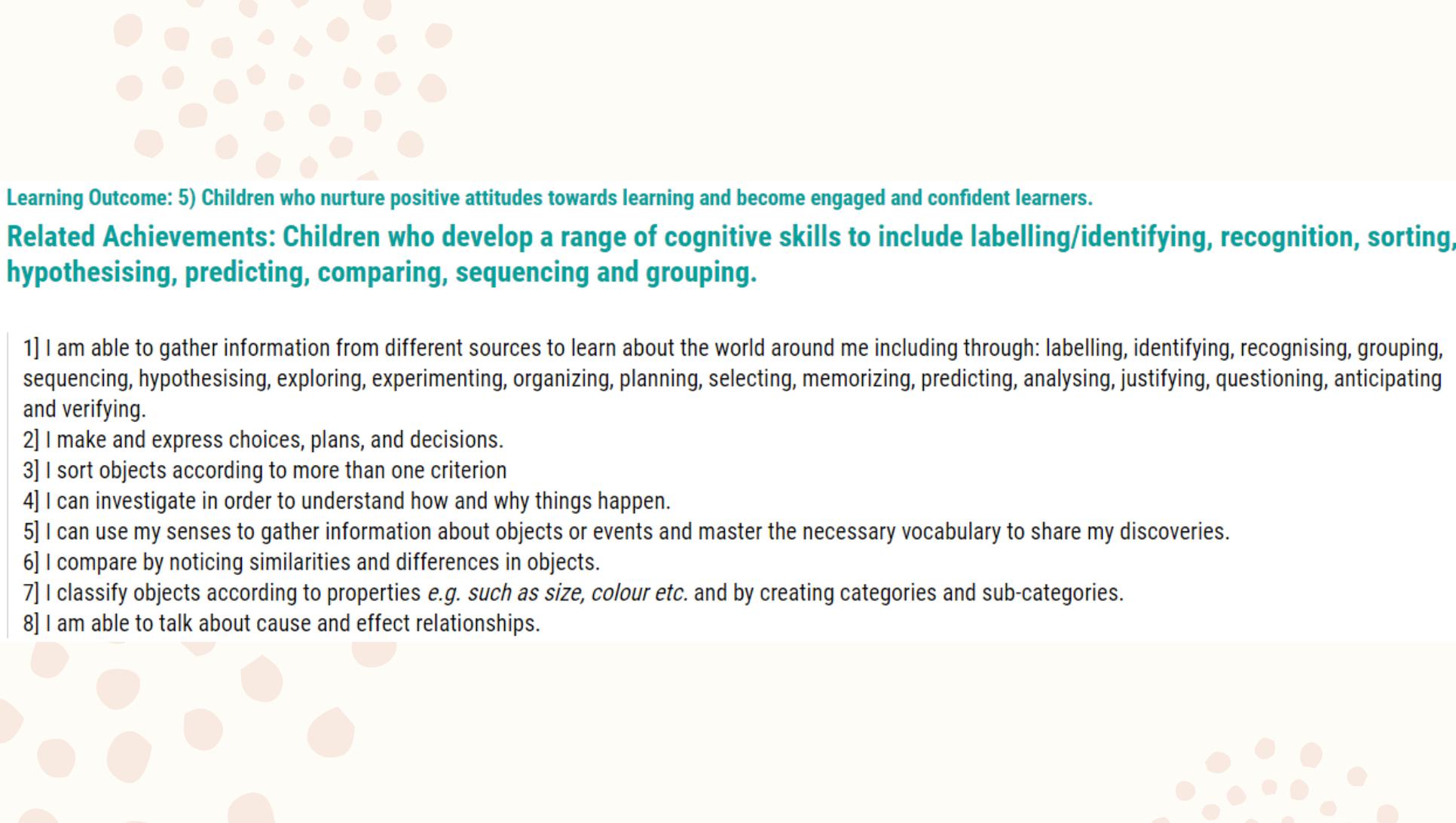
Learning Outcome: 5) Children who nurture positive attitudes towards learning and become engaged and confident learners.

Related Achievements: Children who develop a range of cognitive skills to include labelling/identifying, recognition, sorting, hypothesising, predicting, comparing, sequencing and grouping.

1] I am able to gather information from different sources to learn about the world around me including through: labelling, identifying, recognising, grouping, sequencing, hypothesising, exploring, experimenting, organizing, planning, selecting, memorizing, predicting, analysing, justifying, questioning, anticipating and verifying.

2] I make and express choices, plans, and decisions.

3] I sort objects according to more than one criterion

4] I can investigate in order to understand how and why things happen.

5] I can use my senses to gather information about objects or events and master the necessary vocabulary to share my discoveries.

6] I compare by noticing similarities and differences in objects.

7] I classify objects according to properties *e.g. such as size, colour etc.* and by creating categories and sub-categories.

8] I am able to talk about cause and effect relationships.

Cross Curricular –
Protect the Planet – Sustainable Development Goal 13

Sustainable Development Goals

How can we use t...

Learning Outcome: 1) Children who develop a strong sense of identity

Related Achievements: Children who become responsible and resilient in the face of challenges

1. I demonstrate responsibility for the environment by caring for it to the best of my abilities.

2. I promote environmental sustainability by participating in energy and other resource-saving strategies e.g. switching off lights, turning off taps etc.

Learning Outcome: 3) Children are socially adept.

Related Achievements: Children who are capable of establishing relationships with others.

8] I can share ideas and contribute to decision making effecting my environment.
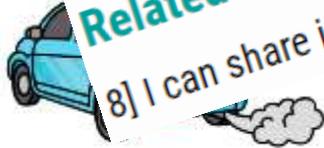
car exhaust

littering & not recycling

ride bicycle

Happy Earth
vs.
Sad Earth

Totschooling

Maths Strands – Number Value and Sorting

Sort & Count Bottles!

the imagination tree

the imagination tree

the imagination tree

What they are learning while they play:

maths: recognising numerals, counting using 1:1 correspondence, sorting and matching by colour, counting up to 10 and beyond

motor skills: using control and precision to pick up and drop small materials, pincer grasp, hand/eye co-ordination

Maths Strands – Shapes and Sorting

DATA HANDLING –STEM/STEAM Challenges…

Linking Data Handling to Art…
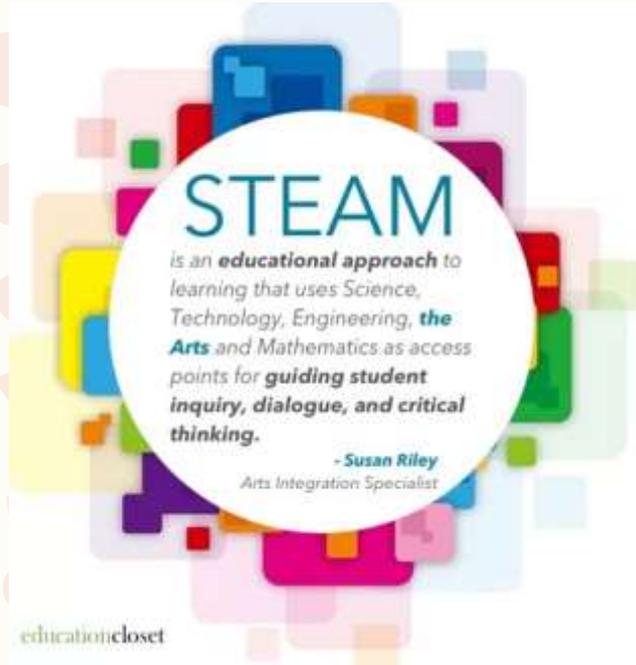
Stem/steam Challenges...

Linking Data Handling to Science...

Sort the toy cars according to distance starting from the slowest (ascending order)

RACING CARS

Challenge: Race a toy car from one end of your desk to the other without touching the car. You must not touch or alter the track.
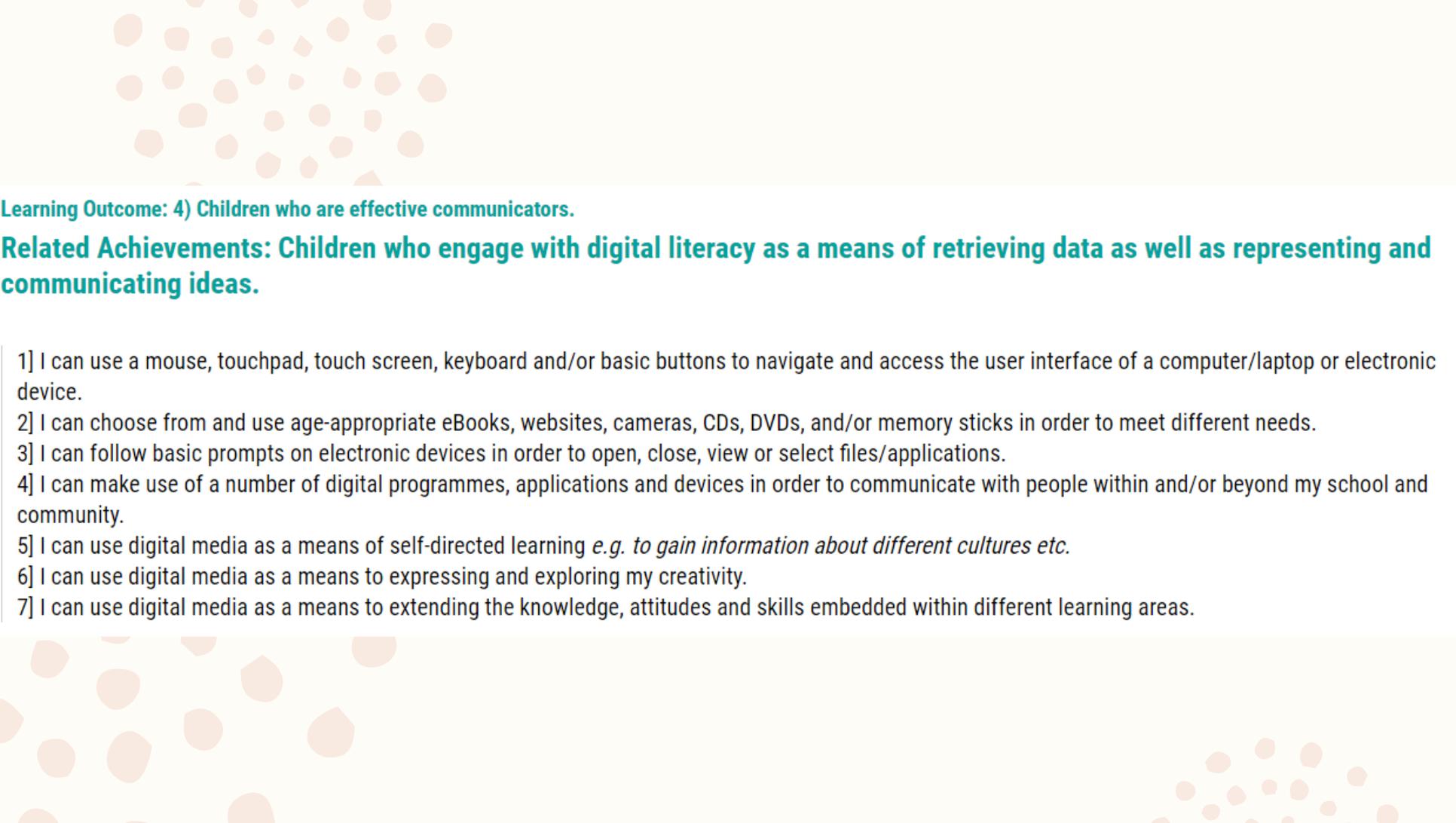
Suggested Materials:
toy car, balloon, string, masking tape, small bits of cardboard, straws, magnets.

Using stories: linking Data Handling to stories

- Linking Maths to Literacy and Science by the use of a story...
- Teaching through the book of *The Three Little Pigs...*
- Sorting which things can be blown by the wolf and which things cannot... (heavy and light)

Data Handling and ICT – Light Panel

Learning Outcome: 4) Children who are effective communicators.

Related Achievements: Children who engage with digital literacy as a means of retrieving data as well as representing and communicating ideas.

1] I can use a mouse, touchpad, touch screen, keyboard and/or basic buttons to navigate and access the user interface of a computer/laptop or electronic device.

2] I can choose from and use age-appropriate eBooks, websites, cameras, CDs, DVDs, and/or memory sticks in order to meet different needs.

3] I can follow basic prompts on electronic devices in order to open, close, view or select files/applications.

4] I can make use of a number of digital programmes, applications and devices in order to communicate with people within and/or beyond my school and community.

5] I can use digital media as a means of self-directed learning *e.g. to gain information about different cultures etc.*

6] I can use digital media as a means to expressing and exploring my creativity.

7] I can use digital media as a means to extending the knowledge, attitudes and skills embedded within different learning areas.
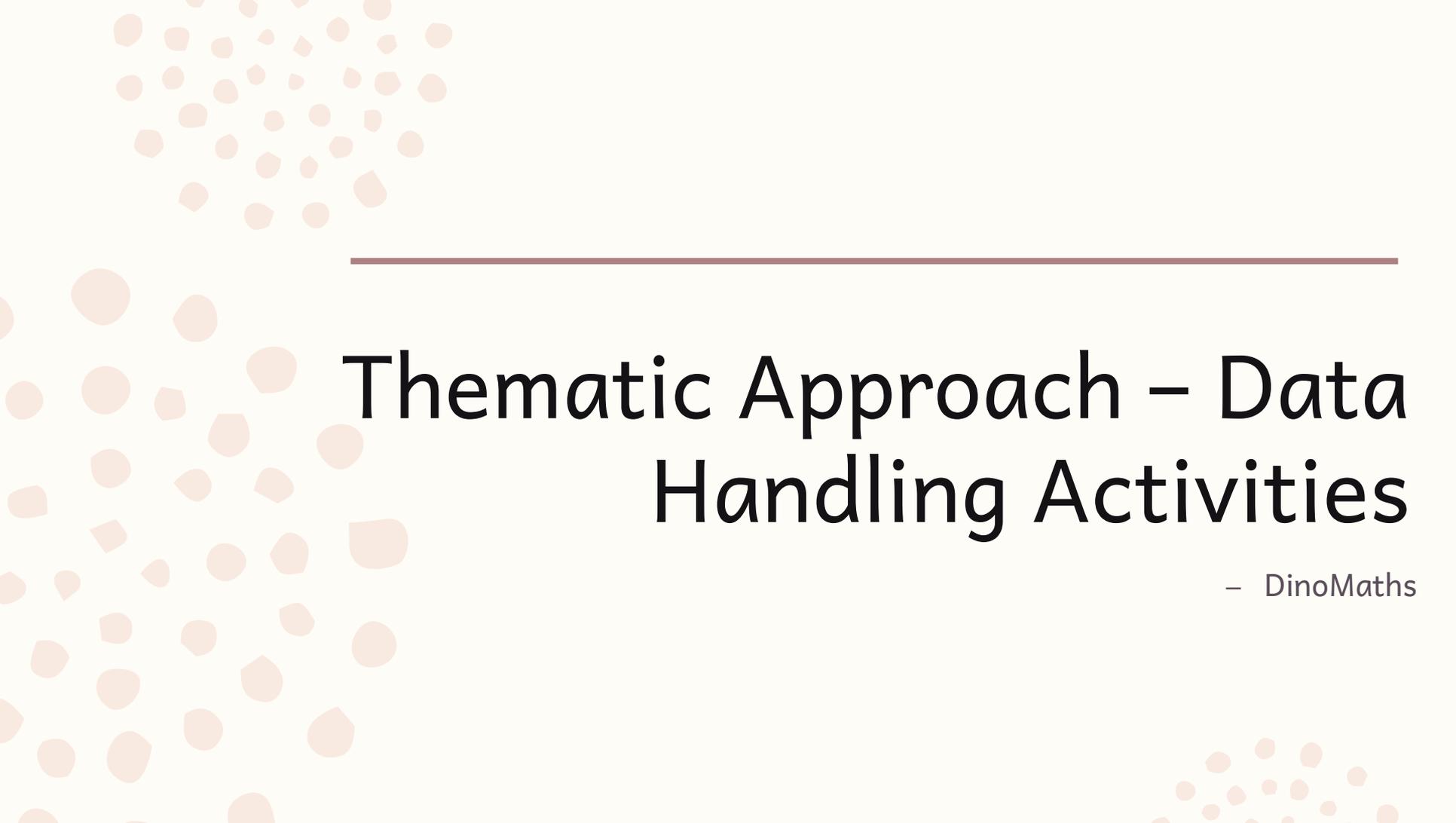
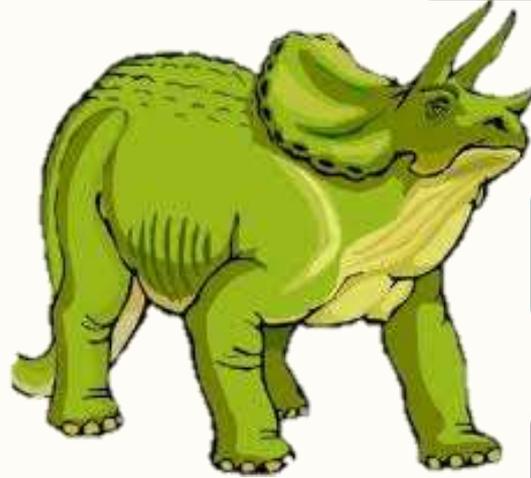# Thematic Approach – Data Handling Activities

— DinoMaths

exploring patterns
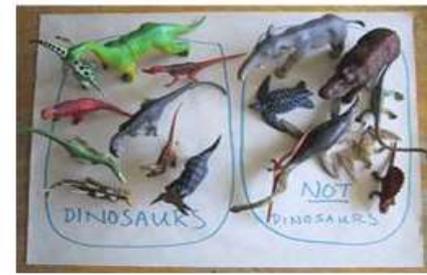
Sorting & classifying

Addition and Subtraction

Measure

Number

exploring shapes

describing position

Sorting and Classifying

- Sorting and classifying objects into sets contribute to the
- development of logical thinking.
- LO (level 1 and 2) – I sort objects into simple categories.
- • LO (level 3) – 4.6.3 - I can sort a wide variety of objects
- during play.
- LO (level 4) – I can sort objects according to more than
- one criterion.

Sorting and classifying

Resources needed: small dinosaur toys, other animals, containers for sorting

Activity 1: Learning about dinosaurs can be tricky for young children. These are animals, but they are extinct. Children can learn more when they know which animals are dinosaurs and which are not. Some dinosaurs were herbivores and some were carnivores. That is another sorting activity to learn more about these animals. Talk about the similarities of the dinosaurs in the set.

Sorting through Science

LO level 4 – I can investigate in order to understand how and why things happen.

Linking Science and Mathematics with this activity. Exploring a number of skills and making it more fun. Resources dino toys, water, balloons and a freezer.

Dinosaur Ice Eggs
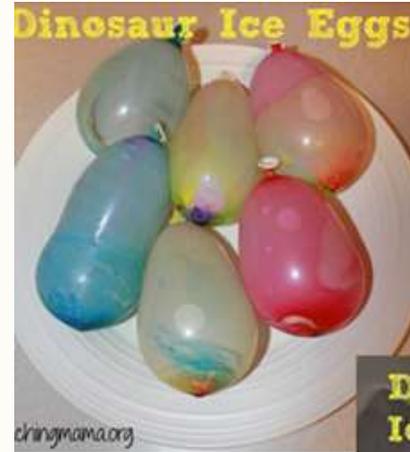
Exploring capacity, weight and time, becoming aware of one to one correspondence......

chingmama.org

... and linking to her curricular links –

Science

Dinosaur Ice Eggs

teachingmama.org

Group Activities – Using the Maths Toolbox

Activity 1 – Buttons

Using all the

buttons used to build the

tower, in how many

ways can you sort them?

Activity 2 Cent Pot Activity

1. Roll the die. Collect coins from the "cent pot" that matches the value of the number rolled on the die.

2. Continue taking turns until there are no more coins in the cent pot. You must roll the exact number.

3. Sort your coins. How many of each coin?

4. How can you introduce tallying?
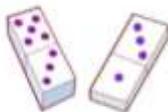
Activity 3 – Dominoes

Sorting dominoes
Maths worksheets from urbrainy.com

UR Brainy

Sorting dominoes

For this activity you need at least 12 dominoes.

Take a pile of dominoes and sort them into three groups:

Dominoes that have a total of less than 7.

Dominoes that have a total of 7.

Dominoes that have a total of more than 7.

Put the dominoes in the correct boxes.

Dominoes with a total less than 7	Dominoes with a total of 7	Dominoes with a total more than 7

Find other ways that you can sort the dominoes and record your results.

Activity 4 -I spy with my little eye...

2. The first player challenges the other one to find two cards next to each other that add to make a particular number. The first player says, "I spy with my little eye two cards that add to make _____."

3. The second player then looks for 2 cards that add to make the number. The two cards to be added need to be next to each other either horizontally or vertically. The player then picks the cards up to add them to their pile. They do this with any other pairs that add to make the number as well.

4. If the second player misses any pairs that add to the number, then player one may claim them.

5. The players alternate taking turns and continue until all the cards are gone.

6. The winner is the player with the most cards at the end of the game.

7. As large gaps appear in the array, move the cards closer together to fill those gaps.
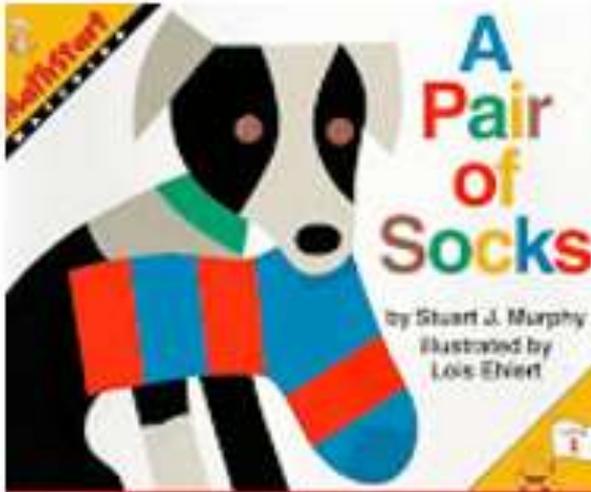
Now look carefully at your cards. Find another way how to sort your cards.

Extra Activity –

Maths through stories

A Pair of Socks by Stuart Murphy

Sorting Socks

Resources –

Pairs of different socks (mixed up)

Pegs

Washing line (optional)

What to do -

a. Look carefully at all the socks.
b. Find different ways how you can sort these socks on the washing line.

Traffic Lights

- To get an overview of the understanding of the class

- Topic checklists are completed at the start of a topic and the information used by the teacher to structure the planned learning -greens first, reds later

- At the end of the topic, students re-traffic light their understanding of the learning outcomes and list what they need to do - make the basis of a revision lesson

Group Activities cont...

– Now, think of some higher order questions which you can ask to your students.

– Examples from Maths and PE activity -

– Close ended questions –

   - Who won the most races?

   - How many more races did Alice win more than Sally?

– Higher order questions –

   - Does the information answer the question who is the fastest   runner

   - Explain your reasoning.

The Importance of Discussion

– Manipulatives themselves do not magically carry mathematical understanding. Rather they provide concrete ways for students to give meaning to new knowledge.

– Students need the opportunity to reflect upon their actions with manipulatives, and through discussion, articulate the meaning they generate, so that the link between their representations and the key mathematical ideas is apparent. (Clement and Sarama, 2009)

Exit Cards

– **Exit cards** are written student responses to questions posed at the end of a class or learning activity or at the end of a day. They may be used at any grade level and every subject area.

Also known as "TICKET OUT THE DOOR"