THE VERY HARD BOOK

By Idan Ben-Barak, Illustrated by Philip Bunting

RECOMMENDED FOR: 4–10 years old **Foundation–Year 4, LOWER TO MIDDLE PRIMARY**

GENRE: *The Very Hard Book* is a non-fiction picture book about the act of thinking. It contains intriguing and comical activities that illuminate the capacities and limitations of the human mind.

THEMES: Metacognition, education, thinking, the brain and humour.

The Very Hard Book is a collection of **metacognitive tasks** in which readers explore their own thinking processes as they occur, through creative engagements with ideas and language. Ben-Barak has created fun tasks that challenge children to become aware of the habits of their human minds. A glossary at the end provides a collection of handy pointers to guide the reader to further knowledge.

ISBN (AUS): 9781760526221

CURRICULUM LEARNING AREAS:

'Metacognition develops best when addressed in a context and integrated into everyday teaching.' Education.vic.gov.au

The Very Hard Book supports learning in all **General Capabilities** primarily **critical and creative thinking**.

Opportunities for students to develop capacity in both creative *and* critical thinking, as well as think beyond mental 'habits' and find alternative strategies and meanings, serves all the **cross-curriculum priorities**.

These notes suggest some curriculum-based activities with metacognitive skill-development embedded in their approaches in the following subject areas: **English, Science, History** and **Visual Arts**

There are also guides to two activities: meditation and journalling, that are not specifically curriculum-based, but that are more generally linked to the development of metacognitive skill.

NOTES WRITTEN BY: Ananda Braxton-Smith

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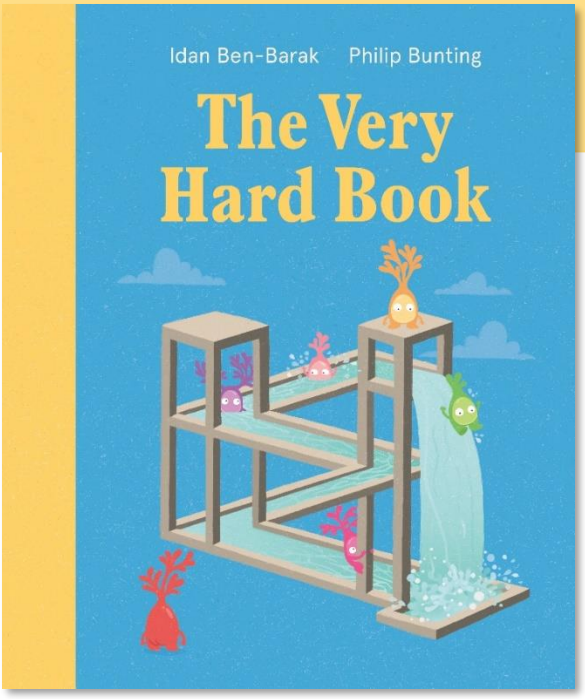


INTRODUCTION AND CURRICULUM APPLICABILITY

The value of a college education is not the learning of many facts but the training of the mind to think. – Albert Einstein, 1921

Metacognition / metacognitive

'Meta-' means above or beyond. 'Cognition' means thinking.
Metacognition is an awareness of one's own thought processes – or thinking about thinking.

The Australian Curriculum Version 9.0 describes metacognition as a sub-element of REFLECTION: one of the four elements necessary to the general capability Critical and Creative Thinking (the other three being Inquiring, Generating and Analysing).

Metacognition enables students to 'identify, describe and evaluate the thinking and learning strategies that they use to complete activities. [Students] reflect on the ways that their thinking, and the approaches they take, may be influenced by external contributions or viewpoints.' [Australian Curriculum Version 9]

Why Do We Need to Think Critically and Creatively?

'Critical and creative thinking represent two important ways of thinking that work together to help students inquire into the world around them.

'Critical thinking involves students analysing and assessing possibilities against criteria for judgement. They construct and evaluate arguments, and use information, evidence and logic to draw reasoned conclusions and to solve problems.

'Creative thinking involves students learning to generate and apply new ideas, and see existing situations in new ways. They identify alternative explanations and possibilities, and create new links to generate successful outcomes.

'Dispositions such as inquisitiveness, reasonableness, intellectual flexibility, open- and fair-mindedness, and a readiness to try new ways of doing things are enhanced by critical and creative thinking. Students consider alternatives and develop persistence throughout the learning continuum.' From the Australian Curriculum Version 9.

It is important for students to have regular experience of critical *and* creative engagements with ideas, in order to learn to balance the mental tensions involved, and to learn to be self-aware thinkers. Students' metacognitive skills increase in sophistication as they acquire more experience.

At primary level metacognitive skills include (from Australiancurriculum.edu.au):

- an ability to explain the thinking behind choices
- an ability to consider alternatives
- an ability to transfer knowledge into new contexts
- an ability to monitor own progress

The Very Hard Book offers Foundation to Year 4 students an enjoyable introduction to the concept of metacognition and will help them on their journey to critical and creative thinking: a capacity which is applicable across all subjects within the Australian Curriculum.

In addition, the art in *The Very Hard Book* and its references serve to constitute a visual challenge to reality and reason and an embracing of paradox and dream, reinforcing the intent of the text.

PLOT SUMMARY

Can you dig half a hole? Or intend to drop something by accident? What about draw a unicorn from memory?

Our minds are strange and entertaining places. In *The Very Hard Book* language plays tricks, our minds do stuff without our permission – and things that don't exist roam free.

Each page presents a new paradox, a new opportunity to explore what is going on inside our heads. Why *can't* we sit in an 'empty' room? Why *can't* we stop thinking about purple turtles once they've been mentioned? Why can't we stop *thinking* at all, even for a minute?

Cognitive phenomena including the Liar's Paradox and the Stroop Effect are explained in the simple glossary at the end of the book, but the paradoxes are fun without theoretical explanation. These concrete experiences of cognitive ambiguity are both fun and enlightening.

Learn about the nature of the human mind: how language works, how we know what's real, and why forgetting is sometimes harder than remembering – all while simply trying to imagine infinity.

CLASSROOM DISCUSSION AND ACTIVITIES

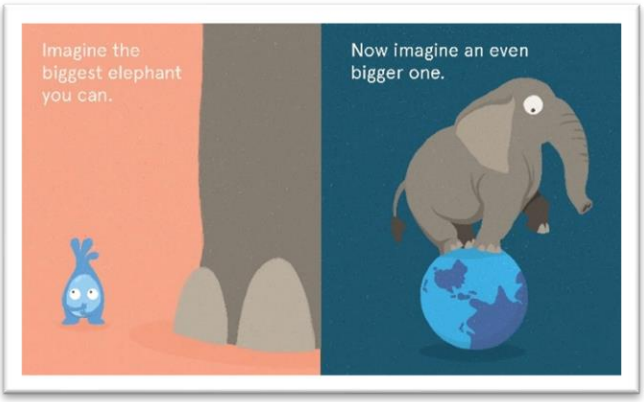
ENGLISH

> ***Alice laughed. 'There's no use trying,' she said: 'one CAN'T believe impossible things.'***
>
> ***'I daresay you haven't had much practice,' said the Queen. 'When I was your age, I always did it for half-an-hour a day. Why, sometimes I've believed as many as six impossible things before breakfast.'*** – Lewis Carroll, *Through the Looking Glass*

LITERATURE

Galactic elephants and Jabberwockies (Foundation–Year 2)

- Some things are impossible but that doesn't mean we can't think about them. Look at the elephants on pages 5 to 7. The artist Philip Bunting has shown them big, bigger and biggest – but can you imagine an elephant that is even bigger?



- Discuss how you could show the biggest elephant you can imagine. Is it an impossible creature to imagine or describe?

- There are many impossible creatures in literature. One is in the poem Jabberwocky by Lewis Carroll. Read the poem with your class.
  - What kind of creature is the Jabberwocky? Can you imagine it? Draw a picture of the Jabberwocky. Share your pictures. Did everyone imagine the same sort of creature?
  - Did you like the way the poem sounded? Did you hear the made-up words, like 'mimsy' and 'uffish'?
  - Read it again and make a list on the board of the words that Lewis Carroll made up for his poem. What do you think the words mean? Do you like the made-up words, or not like them? Why? Make up some words of your own and explain what they mean to someone else.

My favourite impossibility (Years 3–4)

There are lots of impossible creatures in world literature. Some of these can be found in books like *The Bunyip of Berkeley's Creek* by Jenny Wagner, *Golem* by David Wisniewski, *A Book of Mermaids* by Ruth Manning-Sanders and *Jin-Jin the Dragon* by Grace Chang

- Read through some of these stories with your class and explore the unfamiliar creatures like Australian bunyips, Jewish golems or Arabian mermaids.
  - Share your favourite impossible creatures in literature. Read a description of your favourite creature aloud to the class. Talk about why this creature is your favourite. What does it make you feel? Why are they impossible?
  - Listen together to the readings about impossible creatures. Close your eyes and imagine each creature. Which creature did you remember best at the end? Why?
  - Doodle quick sketches of the creatures as you are listening. Share the doodles with the class or in small groups.
  - What do you think the creature might think of you?

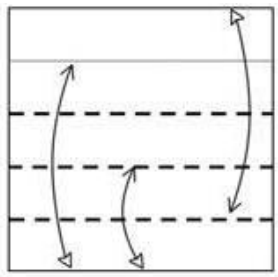
LITERACY

Sharing a notion of an untrue thing (Foundation–Year 4)

- Consider your ability to draw a unicorn from memory. Would it be easier to draw it from life? How could you draw a unicorn? It's a creature that's just not real. Yet somehow we all collectively know about them and what they look like.

Worksheet 1

- Split the class into groups with five students in each group, print out five copies of **Worksheet 1** to use as a guide for each group. Groups sit in circles and prepare to create impossible creatures together. Each person starts with their single piece of paper and a pencil.



- Fold the paper into five equal segments (using the dotted lines as a guide). The goal is for each person in the group to draw five different parts of each creature on each folded segment (without looking at the others) and ending up with five completely impossible creatures.

- Everyone in the group draws a head on the first segment including the neck. It can be any kind of head and neck. It does not have to be real. Fold the paper over so that the head cannot be seen. (Make sure to mark where the neck ends on the next segment so that the next person can see where to connect the next part of that creature.) Pass the paper to the next person in the circle.
- On the new paper, in the next segment, everyone draws a set of shoulders and a body down to the waist, connecting it to the neck. Folds the paper over again and pass it along as above (marking where the waist ends on the next segment). The next parts to be drawn are hips (connecting to waist above) and legs, down to the knees. Fold the paper and pass. Next comes the knees and shins down to the ankles, fold and pass, and the final addition is feet.
- Unfold the papers and share the impossible creatures. Give the creatures names and display them around the classroom.

LANGUAGE

Fact, fiction . . . or what? (Foundation–Year 4)

Some texts give you a story. Some texts give you information. Some books, well, you're not sure what they're for exactly. Sometimes it feels very hard to describe a book. But that's no reason not to try.

- Look closely together at some of the challenges in *The Very Hard Book*. Are they riddles, are they puzzles – or something else? What kind of a book is it anyway?
- If you were describing it to another person, how would you describe *The Very Hard Book?*
- Was it really a very hard book? What was hard about it?
- Does it ask you to do things you don't usually do? Like what?

An end-of-term activity: Letters to next year (Foundation–Year 4)

Think about what you've learnt this year, both what you've struggled with and what you've enjoyed. What was hard at the start but is easier now?

- Write letters to the next students coming to the class you're leaving. They can be anonymous. You can answer some of the following questions to get you started:
  - what was most unexpected?
  - what was the most fun?
  - what was hardest?
  - what was a big relief?
  - what was the most important thing you learnt all year?
  - what do you wish someone had told you?
- Put the letters in a box. Leave them sealed until the new school year. Let next year's students choose letters to share with the class.

General metacognitive practice: learning to drive your brain

Meditation is a traditional way of learning to observe the mind. It has the added benefit of reducing anxiety, which is good for attention and memory. Attention is the foundation for learning.

Journalling is a powerful way to become more conscious of feelings, thinking and other internal mental states. Awareness is the foundation of self-monitoring and change.

A space to breathe and a space to notice (Foundation–Year 4)

- Teachers can research basic breathing meditations – look online for inspiration and ideas. Spend a few minutes together each morning in a class meditation. It may help to guide the class with your voice, using imagery to help focus attention. For instance, try imagining thoughts as clouds moving through a wide blue sky. Notice how the clouds come and go, always moving. Let them come and go. Watch them moving. Imagine yourself as they sky, not as the clouds.
- Start personal learning journals and write in them consistently. The journal can be a physical notebook or a Word document but should be readily accessible and specifically refer to students' learning tasks. Students can use pictures, icons and emoticons as well as language to express thoughts and feelings about their experience of specific tasks.

Here are some ways of using a learning journal:

- Answer STANDARDISED QUESTIONS probing specific tasks: Questions could include: Did I enjoy this task? What did I do that worked well? What didn't work so well? What could I do next time that would help?
- Use pictures of TRAFFIC LIGHTS with their red, amber and green lights symbolising student response. Assign your own meanings to the lights. For instance, you could colour the light green for *easy*, amber for *confusing*, or red for *hard*. Traffic lights can be used to consider progress in parts of tasks, illuminating both problem areas and areas of fluency. Parts of tasks can include: Understanding the task or question? Making a plan? Finding information? Talking? Getting help?
- Use KEYWORDS to spark reflection on a task. Make a list in the journal of the following words and write one sentence in response to each: *I am feeling, wondering, imagining, remembering.*

HUMANITIES AND SOCIAL SCIENCE (HASS)

SCIENCE

Many of life's failures are people who did not realise how close they were to success when they gave up. – Attributed to Thomas Edison, 1877. As quoted in *From Telegraph to Light Bulb with Thomas Edison.*

Science as a human endeavour: Only human

Science began with painstaking observations made by ancient peoples; observations of the movement of heavenly bodies, of the behaviour of animals and birds, and of the properties of plants and minerals. Almost all the conclusions of these early scientists turned out to be wrong. They didn't understand much of what they observed. They made many, many mistakes.

However, millennia of observation and record keeping meant that later peoples could try different approaches to old questions and add their own discoveries to the wealth of observation. We now have answers those earlier scientists couldn't have imagined, based on their hard work.

In the future scientists will find answers we can't imagine now. And they will use our observations to find those answers.

On making mistakes (Foundation–Year 4)

In 1826 English scientist John Walker was working with a flammable chemical mixture (of antimony sulphide, potassium chlorate, rubber and starch) that he hoped would be useful in guns.

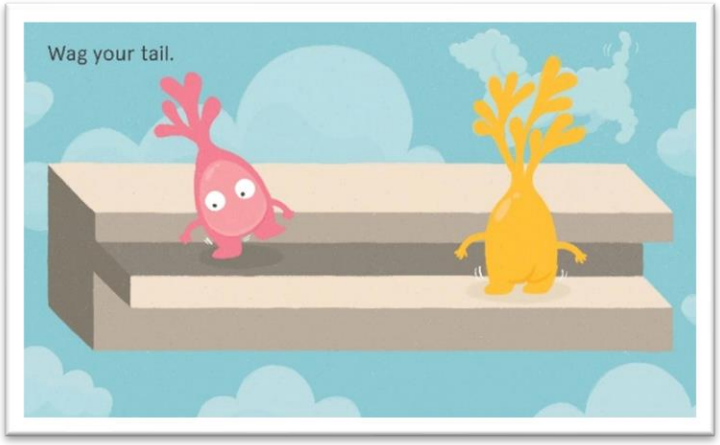
A drop of the substance dried onto a wooden stick and when he tried to wipe it off on the bench – it let off a spark. He had invented the first match!

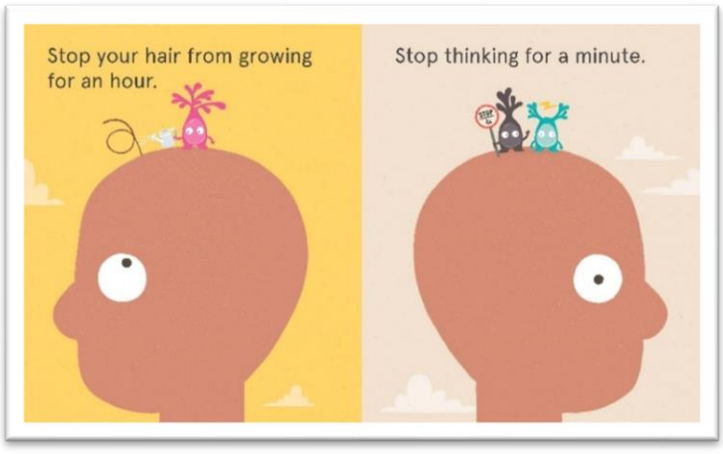
- Find and share books and/or websites telling the history of the marvellous mistakes in science that led to the invention of many modern products and technologies. Start with this National Geographic page: Mistakes Happen.
- Collect the stories, find images to illustrate the story, and make a timeline of these scientists and their mistakes. Choose only the most important information to include in the timeline, such as the scientist's name, the year of the invention, and the original goal. Make it colourful and put it somewhere clearly visible.

  [HINT: There are plenty of great mistakes in art and cooking too!]

Biological sciences: Some features of being alive (Foundation–Year 2)

- Can you stop your hair from growing? Can you stop your brain from thinking? Can you wag your tail? Look together at these questions. They are all about being a living thing.
  - What is it to be a living thing? How is it different to being non-living? Can you just decide to stop growing hair? What else can't you just decide to stop? You have no tail now but there was a time in the past when you might have had one. What happened to that tail?
  - Consider autonomous and non-autonomous systems, and systems that can be both. For instance, we normally breathe without needing to think about it, but we *can* consciously intervene in our own breathing. But we can't do the same with digestion, liver function or our heart beating. Why is that?





HISTORY

Activities that foster critical and creative thinking should include both independent and collaborative tasks, and entail some sort of tension between ways of thinking. (australiancurriculum.edu.au)

History and historical fiction

History is comprised of documentation and interpretation: that is, it is part fact and part fiction. Facts are facts, and give us data, but the stories out of history create personal and national identities. Learning to recognise and negotiate the two is a sophisticated act of cognition. Recognising your own facts and fictions is an act of metacognition.

Family history and family story (Foundation–Year 2)

- Make an archive of class family histories. Prepare some questions to take home and use to discover family histories. Talk with a grandparent – or any older member of your family.
  - Find out where they came from, where they lived as children, and which school they attended. Ask them questions about their lives at school. What did they study? What did they like or dislike? Who was their best friend? What did they wear, and eat, and play? Maybe you can record them talking.
  - Do they have a birth certificate or an old passport which you can scan? Do they have photos or school reports you can copy? Always ask first. Make a collection of the small 'archive' of the copies and store it carefully in a file at school.
  - Open the archives and share the historical research with the class, including the stories. Make an exhibition of all the material, or just show and tell a few at a time.
- Make up a historical fiction called 'A Day in the Life'. You can use words and pictures. Look at the class archives and listen to the stories from the old days to inspire you. Imagine what it might have been like to be a schoolchild in those days. Imagine how that world might have looked, how it smelled, and how it sounded.
- Talk with other people about writing your fictional story based on your historical research. Did you really know what it was like in those days? Or did you have to use your imagination a lot?

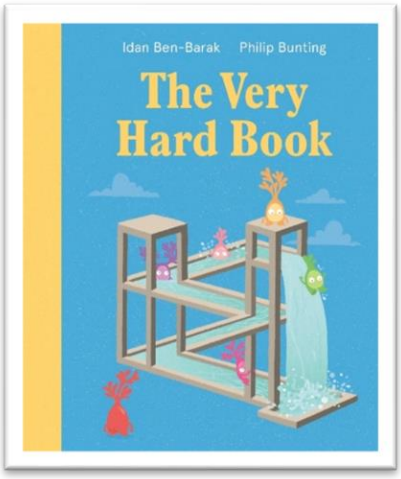
Local history and local story (Year 3 and 4)

Older students can work with fact and fiction at the level of the wider community. Apply both critical and creative thinking to local history. Explore what is history and what is fiction.

- Choose aspects of local history to explore in groups. Decide how you will parse the history: for instance, by date or by theme. Visit the local library and ask the librarian to show you the local history archives. Spend some time trawling through the old papers and photographs. Groups could explore different time spans, or explore different activities, or follow certain people. Scan and copy archival material, always asking first. Take careful note particularly of names, dates and locations.
  - Keep a record of where you got your information and pictures.
  - Have a local history day. Share these aspects of local history with the class.
- Write a historical fiction using your historical research as a jumping-off point. Choose an aspect or character or event discovered in the explorations of your local history. Imagine yourself into that time. Be as detailed as you can.
- Talk with other people about writing your historical fiction. What parts of your local history research did you use? Can you locate it in your story? What parts were imaginary?

VISUAL ARTS

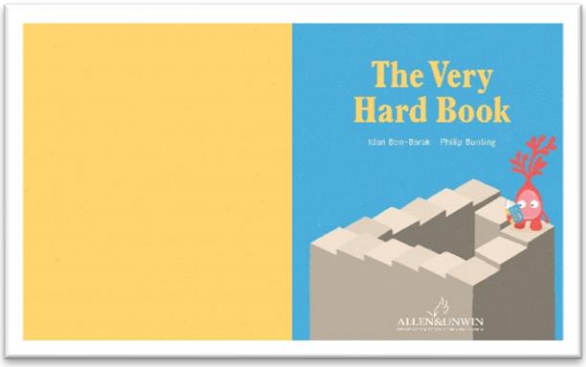
Art imitating life imitating art

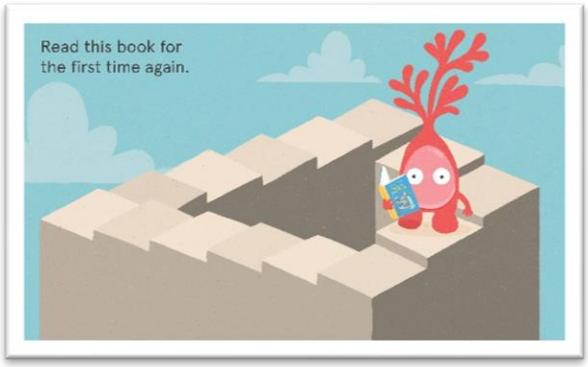


The art for *The Very Hard Book* draws heavily on surrealism, a movement that dealt intensely with philosophical ideas, questions of perception, reality, paradox, memory and mental imagery.

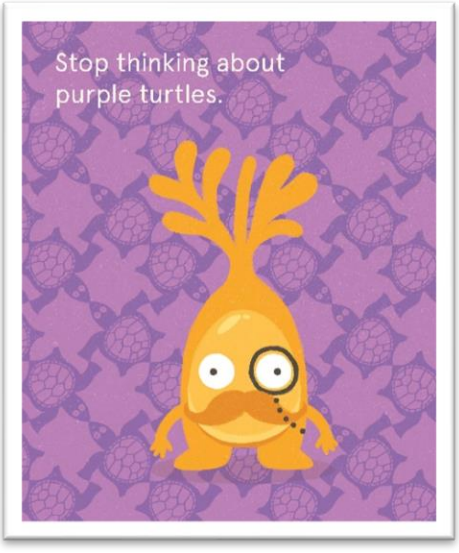
M.C. Escher

- The cover page is a direct reference to M.C. Escher's *Waterfall*. Its themes deal with illusion and paradox (the structure depicted is not physically possible) and infinity (the water runs seemingly in a never-ending cycle). More specifically, it depicts an imaginary perpetual motion machine, which goes against the laws of physics.
  - Research the idea of perpetual motion and discuss why it isn't possible. On YouTube, view examples of perpetual motion machines that have been invented.
  - Use the game of ten pin bowling to introduce the laws of entropy (lack of predictability) and conservation of energy (energy that can neither be created nor destroyed – only converted from one form of energy to another).
- Consider the pages below – where do the stairs start? Where do they end? These illustrations feature an infinite staircase (also known as Penrose stairs), another element that recurs in Escher's works.





- The illustrator makes another nod to Escher (who was fond of integrated, repeating patterns) in the pages of *A Very Hard Book*, which can be seen in the 'purple turtles' illustration.
  - Create a repeated background painting. You could carve and use potato stamps to create a colourful background of integrated, repeated patterns.
  - Alternatively, get messy and paint your hands to create a background of colourful repeated handprints.
  - When the background dries, draw a cute or funny character in the foreground.



Rene Magritte

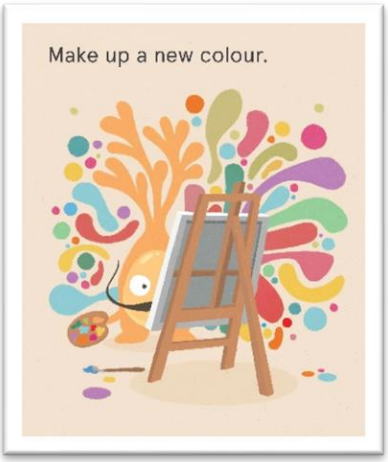
- Throughout the book we can spot several repeating motifs that recur in the work of Rene Magritte. Look at the links to the artworks below, and page through *A Very Hard Book*. Can you match the artist's motifs to Philip Bunting's illustrations?
  - Apples (The Son of Man)
  - Objects (especially clouds) floating in the sky (Castle of the Pyrenees)
  - Objects visually referencing a known form e.g. a cloud dog (*Le Temps Menaçant*)
  - Forming walls (*Personal* Values)
  - Denoting absences
- Magritte is also strongly referenced in the 'Wake up now' page – the illustration shows a window and a painting, but the similarity and continuity between them, as in several Magritte works such as *La condition humaine* makes us question the reality of both and the borders between us, creating a dreamlike state of epistemological uncertainty.

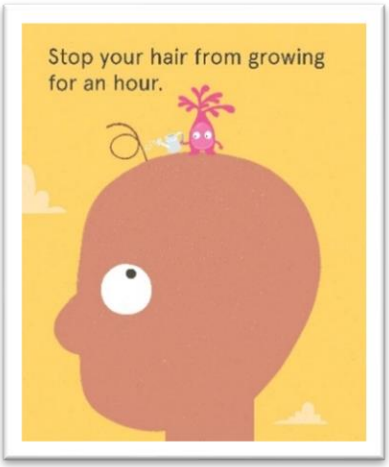
Salvador Dali

- Another great master of surreal art, Salvador Dali, is also referenced here, though less clearly. The 'make your hair stop growing' illustration is reminiscent of some of Dali's desert scenes. One of Dali's famous paintings, The Persistence of Memory is referenced in the glossary page (entry 14).

  Dali was also very well known for his long twisty moustache. Can you find the page that features a very Dali-esque moustache?

Overall, the art in *The Very Hard Book* and its references serve to constitute a visual challenge to reality and reason and an embracing of paradox and dream, reinforcing the intent of the text.





The very hard tasks of Superheroes

Metacognitive skills include a number of capacities. The successful accumulation of *self-monitoring* skills throughout schooling means that students are able to recognise their own personal battles and therefore their own personal wins. Such personal wins can be celebrated, as can the recognition of the battle. This is an activity that provides an opportunity to give expression to the battles and wins of students.

The Marvellous Classroom Universe (Foundation–Year 4)

Superheroes aren't just muscles. They don't win all the time. Every superhero has a unique power and a unique weakness. Superman for instance has great physical strength but he is weakened by the substance kryptonite. Superheroes struggle with (and work hard to overcome) their flaws.

- Superheroes defy the laws of physics – what would it take to be a mental superhero? Reflect with students on their experiences in learning throughout the term or the year. Focus on tasks students found hard and had to overcome by persistence. Teachers can join the class in this activity and model self-analysis and conscious learning. Adults, even teachers, struggle too; they are superheroes too. Share your very hard task and join students in transforming your own struggle into the victory of a superhero.

Self-transformation: Is it a bird, is it a plane?

- In pairs, get students to think and talk with a partner about a task in school that they found very hard over the last term/year. Maybe it was a certain kind of maths, or spelling certain words, or talking to a group. Or maybe something else – like imploding when making a mistake, or learning not be distracted by friends in class

  Ask each other questions about the very hard task. Consider:

  - was the task hard all the way through, or one particular bit?
  - how did you feel while working? What were you thinking?
  - how did you help yourself get through the task?
  - what did you think at first about the task? Did you change your mind?
  - what will you do first next time you have to do that task?
  - what is your superhero power? Remembering? Concentrating? Imagining? Asking good questions?
  - what is your kryptonite? Knowing where to start? Carrying the one? Silent 'e'? Those very very interesting friends?
- On scrap paper sketch small practice pictures of yourself as a superhero. Consider your superhero costume. How will you show your power or the kryptonite you overcame? What is your superhero name? When you've decided the details, draw a large colourful version of your superhero. Fix the superheroes flying around your own Marvellous Classroom universe.

Up, up and away (Year 3 and 4)

- After completing the previous activity, in follow on classes, render the superheroes in other mediums: for instance, clay, paint, found objects or collage.
- When complete, look closely at each other's new work. Compare and contrast the old medium with the new. Do you like it or not like it? Why? Discuss with the class.
- Write a short report on the exercise using accurate Visual Arts language. Consider the following questions:

  - why did you choose the new medium? Was it what you expected?
  - did you enjoy or not enjoy the new medium? Why/why not?
  - did the new medium make you think of new ideas about your superhero? Were you able to show specific features easier or harder in the new medium?
  - how did the medium change your superhero? How?

ABOUT THE AUTHOR

Idan Ben-Barak writes science books, usually for children; they've been translated into about twenty languages and published around the world. *Do Not Lick This Book*, which he created with Julian Frost, was an international hit and won the CBCA Eve Pownall Award. Idan holds degrees in microbiology and in the history and philosophy of science, a diploma in library studies, and a day job that has very little to do with any of the above. He lives in Melbourne, Australia with his family. Sometimes, after they go to bed, he plays his guitar a little.

ABOUT THE ILLUSTRATOR

Philip Bunting is an author and illustrator, with a soft spot for creating picture books for sleep-deprived, time-poor, raisin-encrusted parents (and their children). He believes that the more fun the child has during their early reading experiences, the more likely they will be to return to books, improve their emergent literacy skills, and later find joy in reading and learning. Philip's books have been translated into multiple languages, and published in over 30 countries around the world. Since his first book was published in 2017, Philip has received many accolades, including multiple Honours from the Children's Book Council of Australia, and making the list for the Kate Greenaway Medal in 2018.

ABOUT THE WRITER OF THESE NOTES

Ananda Braxton-Smith is a journalist and highly acclaimed author for children and young adults including a series for older readers, The Secrets of Carrick.

CORRESPONDING LITERATURE

The Bunyip of Berkeley's Creek by Jenny Wagner

Golem by David Wisniewski

A Book of Mermaids by Ruth Manning-Sanders

Jin-Jin the Dragon by Grace Chang

Mistakes That Worked by Charlotte Foltz Jones

The Girl Who Never Made Mistakes by Gary Rubinstein and Mark Pett

The Girl Who Thought in Pictures: The Story of Dr Temple Grandin by Julia Finley Mosca (A young readers' hardback picture book about Dr Temple Grandin, the autistic girl who grew up to be a scientist)

HYPERLINKS IN FULL

In the activities above, webpages have been embedded as hyperlinks throughout. Over time, if information on webpages changes, some of these hyperlinks may no longer work. In these cases, please see below for full webpage URLs and contextual information which you can use to search for the articles using an online search engine or other methods.

Jabberwocky: https://www.poetryfoundation.org/poems/42916/jabberwocky

Accidents Happen, National Geographic. Includes information, activity suggestions, and four great mistakes in science: https://www.natgeokids.com/au/primary-resource/accidents-happen-primary-resource/

Things Kids Invented: https://www.rd.com/list/things-kids-invented/undefined

Worksheet 1

HEAD AND NECK

SHOULDERS TO WAIST
CONNECT TO NECK

HIPS AND LEGS TO TOP
OF KNEES

BOTTOM OF KNEES TO
SHINS AND TOP OF
ANKLES

ANKLES AND FEET