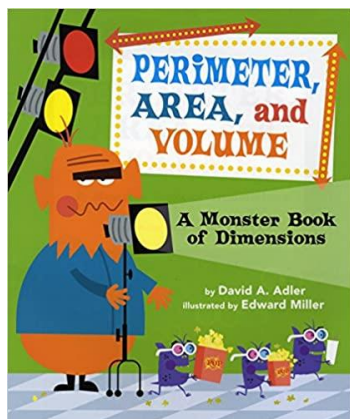


## Math and Science Read Alouds

Kirsten Morrison



### About the Book

Title: Perimeter, Area, and Volume: A Monster Book of Dimensions

Author: David Adler

Illustrator: Edward Miller

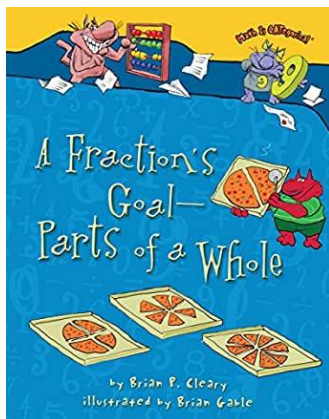
ISBN: 978-0823427635

Grade 4: Math – Measurement

Expectation: Attributes, Units, and Measurement Sense – Estimate, measure, and record length, height, and distance, using standard units

### Description

This book, written by math teacher David Alder, focuses on the perimeter, area, and volume of two- and three-dimensional shapes using common movie theatre items as a reference. We can use this book to teach students measurement specifically the length, width, and height of objects. This book can also be related to the math strand of geometry and spatial sense as it focuses on the differences between two- and three-dimensional shapes. Adler also has books involving algebra, place value, roman numerals, and many more!



### About the Book

Title: A Fraction's Goal — Parts of a Whole

Author: Brian Cleary

Illustrator: Brian Gable

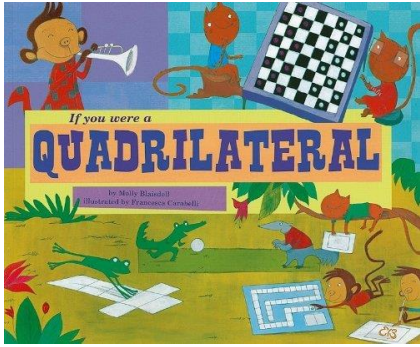
ISBN: 978-1467713801

Grade 4: Math – Number Sense and Numeration

Expectation: Quantity Relationships – Demonstrate and explain the relationship between equivalent fractions, using concrete materials and drawings

### Description

This book introduces readers to fractions in a fun and exciting way; as teachers, we can use this book to integrate language into math or math into language as this book uses rhymes to get students engaged. For number sense and numeration, students can see items divided into fractions such as halves, thirds, and tenths using concrete materials that are kid-friendly. The book shows how one fraction can be shown in a variety of ways allowing students to build connections of equivalent fractions using real-life examples. Brian Cleary has a variety of math and language books, some series include grammar books, math books, books grouping animals and food, and books about sounds.



### About the Book

Title: If You Were a Quadrilateral

Author: Molly Blaisdell

Illustrator: Francesca Carabelli

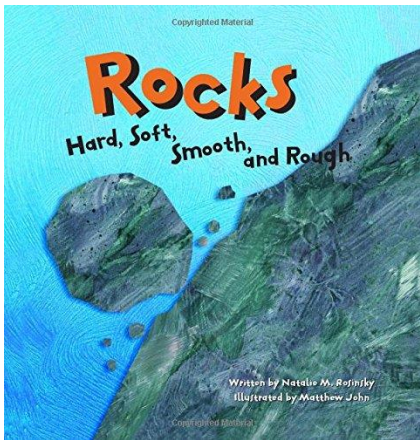
ISBN: 978-1404856905

Grade 5: Math – Geometry and Spatial Sense

Expectation: Geometric Properties – Distinguish among polygons, regular polygons, and other two-dimensional shapes

### Description

This book is part of a series based on shapes and would be a good addition to our classrooms during our geometry and spatial sense unit as they focus on the differences in shapes and how we sort and organize them by their geometric properties. The book gives kid-friendly examples of different types of quadrilaterals and examines the features of a quadrilateral and the specific features of certain quadrilaterals (square, rhombus, etc.); the book also discusses how quadrilaterals are also polygons but not all polygons are quadrilateral. The book features a game at the end by asking students to draw quadrilaterals they see in the classroom which adds a real-life connection to this colourful and fun book; this could be lengthened to become an activity or could be integrated into art by designing a picture with different shapes!



### About the Book

Title: Rocks: Hard, Soft, Smooth, and Rough

Author: Natalie Rosinsky

Illustrator: Matthew John

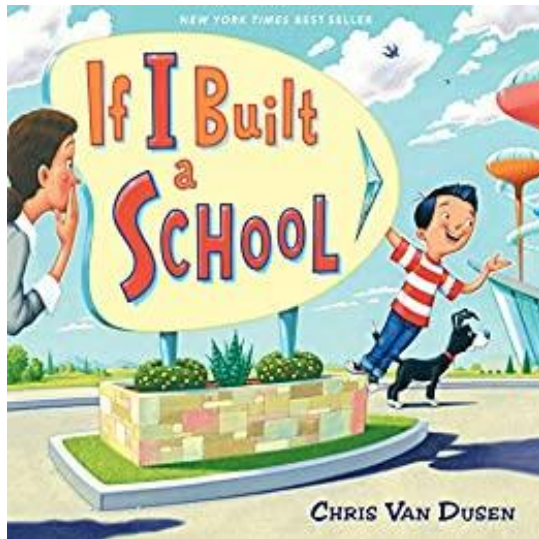
ISBN: 978-1404803343

Grade 4: Science – Understanding Earth and Space Systems

Expectation: Developing Investigation and Communication Skills – Use a variety of criteria to classify common rocks and minerals according to their characteristics

### Description

This book can help students learn to classify and observe different rocks, detect their type (igneous, sedimentary, and metamorphic), and explore their characteristics. The book discusses where you can find each rock which can help students to form a connection from text-to-life. This book fits into the rocks and mineral unit and could be explored by taking students on a hunt for specific rocks based on learned characteristics. This book can relate to the language curriculum as we could consider what makes this book non-fiction and discuss how we know while writing a report on the rocks we found. Although this book is colourful and simple in its concept, it can help students develop a basic understanding of rocks and geology.



### About the Book

Title: If I Built a School

Author: Chris Van Dusen

Illustrator: Chris Van Dusen

ISBN: 978-0525552918

Grade 5: Math and science

- \* For math, it would fit into the measurement or geometry and spatial sense strands and for science, it would fit into the understanding structures and mechanisms strand
- \* This book would also fit nicely into a grade 3 classroom with science being strong and stable structures instead of forces acting on structures and mechanisms
- \* We can also relate this book to social studies, language, and art.

### Description

*If I Built a School* follows Jack, a student with a wild imagination and a plan to create the school of his dreams; although some of Jack's ideas are futuristic and unrealistic we can use his adventure to inspire students to design and create a school of their own. We can use this book to discuss what is realistic and what is not, what features are important in schools and imagine ourselves as architects and designers. This book would work for both science and math as well as language, social studies, and art; it could be used as a summative or a formative assignment. The book includes bright and colourful pictures as well as fun rhymes to get students to think about building their school and what it might look like. Students will be captivated by the possibilities of a "dream school," and will engage in creating their design which can lead to further discussion about realistic ideas, energy, how the school withstands the weather, and what is needed in specific buildings. This book is part of a series and could continue to be used to discuss motion and engineering, specifically *If I Built a Car*; if students continue to work from home, or if this is a project to do at home we could read *If I Built a House*.

### Curriculum Expectations – Grade 5

#### Math:

##### Measurement

- estimate and measure the perimeter and area of regular and irregular polygons, using a variety of tools (e.g., grid paper) and strategies
- distinguish among polygons, regular polygons, and other two-dimensional shapes

##### Geometry and spatial sense

- locate an object using the cardinal directions (i.e., north, south, east, west) and a coordinate system

Students are tasked with measuring the perimeter and area of their design as well as exploring the current school and measuring different rooms and features to get an idea of spacing and size. Students will include locations of rooms in their write-ups and where they are relative to other rooms.

**Science** – understanding structures and mechanisms:

1.2 evaluate the impact of society and the environment on structures and mechanisms, taking different perspectives into account (e.g., families, a school board), and suggest ways in which structures and mechanisms can be modified to best achieve social and environmental objectives

2.3 use scientific inquiry/research skills to investigate how structures are built to withstand forces

2.4 use technological problem-solving skills to design, build, and test a frame

2.6 use a variety of forms (e.g., oral, written, graphic) to communicate with different audiences and for a variety of purpose

3.2 identify external forces acting on a structure (e.g., the weight of people and furniture in a house), and describe their effects on the structure, using diagrams

Students will build their dream school out of popsicle sticks and discuss how schools are built and what is needed for it to withstand the environment; they will need to take into consideration what features are needed in a school and how they change based on location.

**Language:**

Oral communication

1.2 demonstrate an understanding of appropriate listening behaviour by adapting active listening strategies to suit a range of situations, including work in groups

Reading

1.6 extend understanding of texts by connecting the ideas in them to their own knowledge, experience, and insights, to other familiar texts, and to the world around them

Writing

1.2 generate ideas about a potential topic and identify those most appropriate for the purpose

1.3 gather information to support ideas for writing, using a variety of strategies and a range of print and electronic resources

Students will be tasked with listening to the story and participating in think-pair-share before creating their design. Furthermore, students will complete a write-up about their dream school explaining its features.

**Social Studies** – Heritage and identity:

A1.1 describe some of the positive and negative consequences of contact between Indigenous peoples and European explorers and settlers in what would eventually become Canada

A1.2 analyse aspects of contact between Indigenous peoples and European explorers and settlers in what would eventually become Canada to determine ways in which different parties benefited from each other

Although these expectations are not directly related to the activity, I believe this assignment could benefit from engaging students in reviewing structures from the past and how early

societies constructed buildings including homes and schools. Since this is a grade 5 activity, we could look specifically at indigenous people and their structures as well as European structures before 1713 which would relate to the heritage and identity strand.

**Art – visual art:**

D1.1 create two- and three-dimensional art works that express feelings and ideas inspired by their own and others' points of view

D1.3 use elements of design in art works to communicate ideas, messages, and understandings

D2.3 demonstrate an understanding of how to read and interpret signs, symbols, and style in art works

Students will be tasked with creating blueprints for their imaginary school and must use symbols to demonstrate doors and windows as well as the different rooms. They will also have the option of drawing pictures of some of the rooms and will need to build a structure of their school which requires some artistic ability as they will be given a grade on their designs.

#### Follow-up Activity

After reading the book, students will be tasked with creating blueprints of their very own “dream school,” complete with features from our current school and features that they wish we had. Students will pair up to brainstorm ideas and discuss rooms needed and we will create an anchor chart containing features needed; students will also have time to explore the school, depending on if this is allowed at the time, and see the sizes of rooms and how they differ for what is needed in each (the gym is often the biggest room, not all bathrooms are the same size, etc.). This task will be completed first on grid paper and students will be asked to calculate the areas and perimeters of their rooms as well as including doors and windows. Students will receive feedback and be able to polish their blueprint. This activity will be a follow up to a previous activity where students designed their room and will be introduced by reading the book *If I Built a School*. Students will use prior knowledge to complete this activity alone. Students will hand in their final blueprint as well as a write-up describing their school including details about why it's organized the way it is, why certain rooms were used, and the features that are realistic and those that are not (if they chose to do unrealistic rooms).

After students will work in groups to create a school incorporating features from each student's school then will be tasked with building their schools out of popsicle sticks and other materials provided. Finally, students will present their designs in groups and we will discuss how we would make a school in real life to account for location, weather factors, and need for proper building supplies.

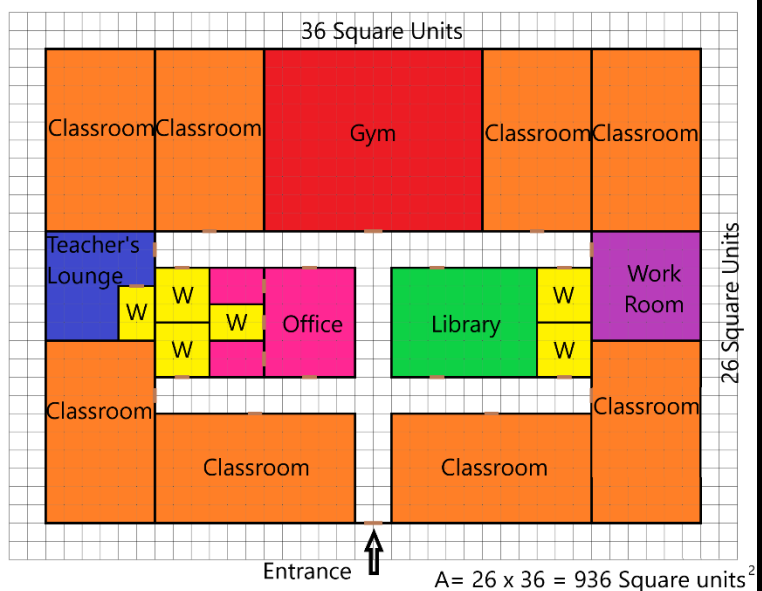
This activity could be modified if students were doing online learning at home by reading the book *If I Built a House*, also written by Chris Van Dusen, and designing their own home rather than a school; students would then measure their homes or explore them for ideas depending on available resources. Students may choose to browse or use if working from home, <https://floorplancreator.net/plan/demo>, this could also be used if we have Chromebooks available in class. We can also add specific shapes needed, rooms needed, sizes of rooms required in a criterion to make it more difficult and show that students know different shapes and can follow instructions.

Plan:

- Read the book then think-pair-share ideas about our dream schools versus our current school
- Work with partners to discuss the features of schools and our ideas about our dream school. Discuss blueprints of bedrooms previously created
- Start on their blueprint of school
- Measure the perimeter and area of the rooms
- Hand in the completed blueprints for feedback
- Students revise their plan and create a final blueprint of school (formative)
- Students will be tasked with completing a write up of their school describing features and why they organized it the way they did
- Discuss building and creating schools
- In groups create a blueprint of a school, students will name it and have the choice of drawing design ideas of rooms
- In groups, students will be tasked with building their school out of materials supplied
- Discuss how we would build them in real life, how will they withstand the weather?

Example:

This is an example of a blueprint of an imaginary school, I would hope that I would receive something similar before giving feedback which students will take to make this example better. I would use this example at the beginning of the activity and ask students what is missing and what we can improve based on our success criteria. We will also discuss positive feedback such as great use of colour or well done on figuring out the area of your school!



Some example of constructive feedback:

- Missing doors to two classrooms
- No windows shown
- Measurements of each room are not included
- Include some more creative rooms, what do you want to see in our school?
- Add more exits, where do we exit for recess?
- Should our school have a kitchen?
- Add the full label of washrooms or create a legend

The rubric of final blueprint and write-up:

Assignment:

Name:

	Level 4	Level 3	Level 2
Measurement:  Knowledge and understanding	The student included all measurements (perimeter and area of rooms and whole school) and are correctly calculated	The student included most measurements (perimeter and area of rooms) and mostly correctly calculated	The student included some measurements and was not correctly calculated
Geometry and Spatial Sense  Knowledge and understanding	The student correctly identified the shapes of rooms and their location relative to other rooms	The student correctly identified the shapes of rooms or discussed their location relative to other rooms	Student discussed shapes or location of rooms but was incorrect for some
Design  Thinking and Application	The student identified rooms needed in a school and placed windows and doors where necessary	The student included most rooms needed in a school (e.g., forgot bathrooms or office) and included doors and windows	The student design was fully unrealistic, included little to no rooms needed in a school.
Creativity  Application	The student took time and put effort into their design. They thought of interesting ways to include their realistic ideas. Students included a variety of rooms	The student took time and put effort into their design. Students included a variety of rooms but did not have their own ideas	The student did not put a lot of effort into their design, their blueprint was messy and unorganized
Write-up  Thinking and Communication	Write-up is well written, organized. and includes detailed information about the dream school. Students discussed the features needed and why. Students included information on the location of rooms	Write-up is organized or well written. Write-up includes most details about the dream school. Some information is missing (location or the need of features)	Write-up is not organized. The write-up includes some details about the dream school. Most information is missing (location or the need of features).

Comments: