



Geometry Friends

Creating & Personifying Geometry Friends
Kindergarten





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Geometry Friends

A comprehensive unit that:

- Aligns with many Common Core Learning Standards
- Encompasses multiple math and literacy learning opportunities
- Provides valuable hands-on performance-based learning projects
- Stresses the importance of visual learning
- Develops life-long oral and written communication skills
- Offers differentiated learning opportunities
- Engages students in geometry

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Instructor Guidelines

Thank you for purchasing *Geometry Friends* for your kindergarten class! We are confident that your students will enjoy learning language arts and oral presentation skills within an engaging geometry unit. We want to give you a few suggestions on how to best utilize this kit:

Geometry Friends.PDF – This document contains all of the documentation for this comprehensive kit. It is in PDF form to keep it properly formatted and uneditable. Keep an intact copy of this as the reference document for the unit.

Teacher Materials – These pages are provided as a Word document so that you can edit them to meet your own requirements. We have designed this unit with the expectations that teachers will revise it somewhat to make it their own and to meet the individual needs of their classes.

- **Vocabulary** – Feel free to add or delete words and to tweak the definitions if desired.
- **Essential Questions and Big ideas** – These are supposed to get the creative juices flowing! Brainstorm with the class to come up with other essential questions and big ideas and then involve the class in great critical thinking opportunities. Remember, it is important for them to see the big picture and understand why Geometry is relevant to their lives..
- **Common Core Learning Standards (CCLS)** – Isn't it exciting to see how many standards you can cover in one lesson!
- **Instructor Details** – These pages give specific suggestions for the individual projects. Feel free to tailor them to meet your needs.
- **Math and Writing Rubrics** - These rubrics have been designed using the same terminology and requirements as the student checklist, which has the same terminology as the Common Core Learning Standards. By using these valuable assessment tools, you are providing your students with the opportunity for them to assess themselves as they are working and for both the students and their parents to understand the grades that you award them at the end.

Student Handouts - This document was compiled with the expectations of you printing and handing these pages out to the students. They are also in Word document format so that you can edit them to meet your needs.

- **Vocabulary without Definitions** – for the students to use if you want them to look up the definitions.
- **Performance Task** – You can edit this task to fine tune it with regard to your students and community.
- **Project Details** –The Instructor Detail Pages provide detailed project instructions.
- **Student Checklists** – The project checklists are less detailed then the writing checklists. Feel free to add other requirements that you feel are important to the project checklists. The writing assignments have more detailed checklists that use the terminology from the CCLS. The writing rubric uses the same terminology as the CCLS and the checklist, so if you edit the writing assessment piece, be careful to keep them aligned with the appropriate standard.

Project Templates – The templates that you will need for the projects are in a separate folder. Before beginning that project, make sure the template is available to the students on their computers or network drive.

Tutorial Videos – The tutorial videos are accessible from our website. Use the password that you were given to download this kit to access the links to the project videos. The videos will teach the students step-by-step to make the projects. Pause the video as needed to allow them to work, contemplate, organize and save their work. Manipulating graphics is a very creative form of self-expression. These projects will prove that the students understand the material they have learned and give them an opportunity to teach back in an effective visual format. Let the students have the time to work, make mistakes, correct their mistakes, and revise their layouts, so that they can complete a project they can show with pride.



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Introduction

Children love using computers and what better way to motivate them! With the use of Graphics-Toolbox and the *Geometry Friends* Curriculum Kit, the students can develop their math and literacy skills, meet the Common Core Standards and enhance their knowledge of geometric shapes in a fun, creative way.

Shapes are all around us and can be easily overlooked. When kids are able to manipulate and make their own creations, they can see how shapes are everywhere. When a child points to a roof and says, "That's a triangle!" you know connections are being made.

The best kind of learning is when learning is fun and watching students have fun while learning is rewarding to teachers. While using this kit, your students will be having fun and not even realize that they are learning. At the end of this unit, your students will not be bragging about all of the Common Core Standards that they met, but they will, enthusiastically, tell you about the fun they had with shapes on the computer! You will recognize that the comprehension has gone much deeper and the foundation for a life time of math skills has been laid.

We hope that you and your students learn as much from using this unit as we did from developing it! Please contact us with your feedback. We are continuing to expand our library of Common Core Learning Units and we are interested in your comments on this kit and your suggestions for future topics. Happy learning!

Sincerely,

Justine Jacobson

Kindergarten Teacher



Summary / Purpose

This unit will develop a knowledge of shapes in a fun and imaginative way. The students will be engaged in this geometric unit in a creative and rewarding manner. They will explore shapes through color, sorting, and graphing. The unit continues to provide for shape exploration, to create Geo-figures, show them in a familiar school setting, and develop oral language skills through a final presentation to classmates. It aligns with dozens of the Common Core Standards which again allows teachers to have the students meet the required standards in an exciting project-based format.

Overall, most of the **Common Core English Language Arts Standards for Kindergarten: Reading Informational Text, Writing, Speaking & Listening & Language; and Math Standards: Counting & Cardinality, Operations & Algebraic Thinking, Measurement & Data, and Geometry** are covered in this unit. As you engage your students in learning, you can be confident that you are aligning your curriculum with the standards that are expected of all kindergarteners across our nation.

Expectations

By the end of this unit, the students will not only recognize and name shapes but also sort/categorize, rearrange and create new and complex images using basic shapes. They will develop both geometric and creative language skills through oral discussions. They will dictate/write sentences about their new Geo-friends. All of which align with the Common Core Standards and prepare them for future projects in kindergarten and higher grades.

You can expect your kindergarteners to:

- Identify geometric shapes: Square, Rectangle, Circle, Oval/Ellipse, Triangle, Rhombus, Pentagon, Hexagon, Octagon
- Classify/Sort shapes according to category (shape, color)
- Graph shapes correctly
- Use Correct vocabulary when comparing, sorting, and talking about shapes
- Build interesting people and animals using the shapes
- Personify the geometric people/animals that they create
- Count the number of shapes they use in their creations.
- Use correct geometric vocabulary when talking about their creations
- Proudly present their creation in an oral presentation format, using correct vocabulary and imagination.
- Utilize the shapes to create equations.

By integrating *Geometry Friends* into your curriculum, you are adding rigor into project-based education. You are integrating relevant technology into their learning, raising the bar on your expectations of your students and preparing them to be competitive in school and their future careers. The hands-on projects will help the students learn the material in a deeper way and they will be able to express their own personal creativity in the execution of those projects. You are also helping them to learn to assess their level of knowledge and performance by using the checklists and rubrics that are included with the unit. And by giving them the opportunity to learn the material in a more intimate and thorough way, you are helping them achieve 4's on those rubrics!



Unit Projects

1. Shape Sort
2. Exploring Shapes
3. Building Geo-Friends
4. Graphing Shapes
5. Equations
6. Integrating Geo-Friends into the Classroom
7. Oral Presentation (Share Time)
8. Geo-Friend Writing (Yearbook)

Required Software

- Graphics-Toolbox
- Microsoft Word

Provided Templates

- Shape Sorter Template
- Geo Friend Shape Sheet – Solid geometric shapes
- Shape Graph
- Yearbook Page Template

Available Videos

- Coloring Geometric Shapes
- Moving Geometric Shapes
- Typing in Graphics-Toolbox
- Copying and Building Interesting Shapes
 - Creating Geometry Friends
- Adding Your Geo-friend to a Photograph
- Creating a Geometry Friends Yearbook



Common Core State Standards¹ Covered in

Geometry Friends

English Language Arts Standards » Writing » Kindergarten

Text Types and Purposes

W.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

Production and Distribution of Writing

W.K.6. With guidance and support from adults, explore a variety of digital tools to produce and publish writing, including in collaboration with peers.

Research to Build and Present Knowledge

W.K.7. Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).

W.K.8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

English Language Arts Standards » Speaking & Listening » Kindergarten

Comprehension and Collaboration

SL.K.1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

- Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).
- Continue a conversation through multiple exchanges.

SL.K.2. Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.

SL.K.3. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

Presentation of Knowledge and Ideas

SL.K.4. Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.

SL.K.5. Add drawings or other visual displays to descriptions as desired to provide additional detail.



SL.K.6. Speak audibly and express thoughts, feelings, and ideas clearly.

English Language Arts Standards » Language » Kindergarten

Conventions of Standard English

L.K.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

- Print many upper- and lowercase letters.
- Use frequently occurring nouns and verbs.
- Form regular plural nouns orally by adding /s/ or /es/ (e.g., dog, dogs; wish, wishes).
- Understand and use question words (interrogatives) (e.g., who, what, where, when, why, how).
- Use the most frequently occurring prepositions (e.g., to, from, in, out, on, off, for, of, by, with).
- Produce and expand complete sentences in shared language activities.

L.K.2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- Capitalize the first word in a sentence and the pronoun I.
- Recognize and name end punctuation.
- Write a letter or letters for most consonant and short-vowel sounds (phonemes).
- Spell simple words phonetically, drawing on knowledge of sound-letter relationships.

Mathematics » Kindergarten » Counting & Cardinality

Know number names and the count sequence.

K.CC.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

Count to tell the number of objects.

K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality.

- When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
- Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
- Understand that each successive number name refers to a quantity that is one larger.
-

K.CC.5. Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

**Compare numbers.**

K.CC.6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.¹

K.CC.7. Compare two numbers between 1 and 10 presented as written numerals.

Mathematics » Kindergarten » Operations & Algebraic Thinking**Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.**

K.OA.1. Represent addition and subtraction with objects, fingers, mental images, drawings¹, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

K.OA.2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.OA.5. Fluently add and subtract within 5.

Mathematics » Kindergarten » Measurement & Data**Describe and compare measurable attributes.**

K.MD.1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

K.MD.2. Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.

Classify objects and count the number of objects in each category.

K.MD.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.¹

Mathematics » Kindergarten » Geometry**Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).**

K.G.1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.



K.G.2. Correctly name shapes regardless of their orientations or overall size.

Analyze, compare, create, and compose shapes.

K.G.5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

K.G.6. Compose simple shapes to form larger shapes. For example, “Can you join these two triangles with full sides touching to make a rectangle?”