Extending Eric Carle into Mathematics

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Overview

Many students are introduced to Eric Carle's work early on in their academic careers. His illustrations are bright and interesting. The text is written with a pattern students can easily follow, in addition to building understanding and familiarity. Many of Eric Carle's pieces can be extended into other curriculums besides literacy. This connection of literature to other subjects is rarely presented to children while they are attempting to study areas such as math and science. Students benefit from familiar, enjoyable literature pieces to feel more comfortable with these other subject areas. The unit, Integrating Eric Carle into Mathematics, will focus on becoming personally involved with Carle's work and bringing the literature to life in the area of math, however science and social studies connections will be noted.

Students' families will also be involved in the process as the aim of the unit is to create a united front between home and school as well as literacy and other curriculums. Students working first with literature will begin to feel more confident when attempting new concepts. These will not seem so foreign when introduced using fun, familiar literature and having the opportunity to make connections with the work. Students are familiar with responding to literature and through this unit students will be responding to the literature creating valuable math connections. From the time students being with literature in a school setting they are asked to personally respond and should feel comfortable doing so.

Rationale

Students face many challenges when they begin to tackle new ideas in their education, especially in math. As the math curriculum advances in first grade students are beginning to explore new areas that begin to take more time, study, and practice to

master. This can be a frustrating challenge for a novice learner. This can be particularly challenging for students who are not achieving success as readily in math as they are finding with other subjects. Incorporating strengths and consistently focusing on areas to be improved are a major part of this unit to ensure success for each and every learner.

With the aid of exciting new materials and accompanying literature students will begin to feel more comfortable as they are synthesizing new concepts. Working with literature would assist in building confidence and students would be able to feel familiar with the text as a foundation to their learning. Students will begin to create a personal relationship with the literature and can apply text personally as they are creating meaning to be applied to the curriculum. From the first day we are in school books are everywhere and we are raised in the education world to respond personally to the literature at hand.

As previously mentioned, books are a readily available resource. Many teachers have their own classroom or personal library, schools may have libraries, there are still many public libraries, and more and more companies are willing to donate or sell cheap children's books on the internet. There is no longer any excuse for books not to be available in the classroom. Books are a great introduction and gateway to a discussion and usually one book covers more than one topic. We respond differently to literature and our personalities may key in more so to one part or idea than another. In a classroom of budding first graders this is a prime time to touch upon areas that require attention, but may not fit directly in everyday curriculum. These include friendship skills, cultural differences, and concepts that apply to forthcoming curriculum.

Teaching with a theme, such as Eric Carle, can be greatly rewarding. Not only are students motivated but teachers are also motivated. In the case of Eric Carle, his work is not strictly limited to one character or a few books. An investigation into Eric Carle has something for everyone. There is a lot to explore and many different routes to take to ensure success.

Some benefits of theme teaching include:

- Learning in-depth factual information
- Becoming physically involved with learning
- Learning process skills
- Learning "how to learn"
- Integrating learning in a holistic way
- Promoting group cohesiveness
- Addressing individual needs
- Motivating children and teachers (Kostelnik, Soderman, & Whiren, 2004)

This unit is designed to take into account Howard Gardner's theory of multiple intelligences. The main goal of this unit is to reach all learners and create unity across curriculums. Gardner's theory addresses the idea that students learn in different ways. His intelligences include linguistic, logical-mathematical, musical, kinestic, spatial, interpersonal and intrapersonal. These intelligences make up the personality of each classroom. "All seven intelligences are needed to live life well. Teachers, therefore, need to attend to all intelligences, not just the first two that have been their traditional concern. As Kornhaber (2001: 276) has noted, it involves educators opting 'for depth over breadth'. Understanding entails taking knowledge gained in one setting and using it in another. 'Students must have extended opportunities to work on a topic'"

Objectives

This unit will be used in a first grade classroom. Parts of the unit will be used during the literacy block which is a 120 minute block of the day, while others parts may be used in the math block which is 90 minutes in the middle of the day.

Objectives of this unit will include:

- Practice with measuring and estimation with the book Pancakes, Pancakes
- Measuring time using Today is Monday
- Creating and extending patterns using A Very Busy Spider
- Practice measuring and data analysis using the Very Hungry Caterpillar
- Counting to 10, using ordinal numbers, and practicing math facts using 10 Little Rubber Ducks and 1, 2, 3 to the Zoo

Background

To begin this unit I have researched Eric Carle books to ensure the books chosen are most applicable to the subject areas. The final books will have to be put into an order to introduce to the students based on their knowledge and best practice for learning. A timeline will designate when each book should be introduced. There are many online resources for Eric Carl that will be able to guide this process as well as examining the needs of the students. I will also need to compile a list of web sites for students to explore on their own time as well as finding secondary literature to build up the topics of study. While Eric Carl's books will be the most evident in the unit, it is important to have as much supporting literature as possible in the unit accessible for the students. There are many pieces of literature that can be used to support math concepts.

Strategies

Strategies that will be used in this unit include teacher read aloud followed up by student led investigations into particular topics. The students will be in control of their own learning and will have choices as to what follow up activities they would like to complete. When we are working with time students will create their own timeline of

their own day and when working with estimation/measurement students will be able to explore the topic through cooking. Students will also be working hands on with time as well as leading explorations of counting and basic math facts.

Students can use library and computer sources to complete follow up research and extensions to classroom activities. Students will be guided through various selections and based on feedback, select appropriate choices for their learning. Technology is an amazing asset to a child's education. More frequently children are able to apply their own knowledge of technology to get started right away with very little assistance.

An additional strategy to be included is teacher read a loud followed by a discussion. The teacher will read the book aloud to the class and begin a discussion of various topics to the students as well as address any topic students feel is worth mentioning. The teacher will demonstrate incorporating math concepts in literacy and promote making personal connections.

Students will be working with hands on manipulatives, such as rubber ducks, puppets, and clocks. These will be used to reinforce students counting, working with math facts, and time all at the hands of the students. These manipulatives will be child friendly and easy for the students to use during the school day. Manipulatives can also be sent home for a student to share with their family. The most important aspect of the manipulatives is they should be very user friendly.

Another strategy included is response through writing. Students will engage in responding to text via poetry and song. They will create their own piece of Eric Carle inspired literature. Writing can be done individually, with a partner, in a small group, or done as a whole class using shared writing.

Classroom Activities

The first activity students will begin with is taking a walk through of Eric Carle books. The teacher will introduce that Eric Carle's literature is going to be used as a critical piece of their mathematics. Many students in first grade will come in already familiar with Eric Carle. The teacher can ask background questions to understand children's familiarity and build a foundation for their future readings.

10 Little Rubber Ducks

One activity will be using the book *10 Little Rubber Ducks* to help students practice counting up to 10, working with ordinal numbers, and begin working on addition facts up to 10.

Lesson Objective:
Students will be able to count up to 10. Students will practice addition facts adding up to 10.

Materials:

- *10 Little Rubber Ducks* text
- Prepared cut outs for teacher
- Rubber ducks
- Cut outs for class
- Popsicle sticks

Procedure:

- The teacher will introduce the text *10 Little Rubber Ducks*. Students and teacher will go on a picture walk before the book is read aloud to aid in comprehension and memory.
- The teacher will then read aloud the story while students are able to respond to the literature. Some questions to ask while reading include identifying ordinal numbers in the book. The teacher will ask questions using ordinal numbers as they appear in the text.
- After reading the book students will begin a hands-on project of creating duck puppets and placing them in order, like is seen in the book. The teacher will have a set of puppets and rubber ducks ready that the students can practice their new skill. These ducks will also be used for students to begin basic addition facts in a hand on way.
- Once the duck puppets are completed students can use the puppets to practice ordinal number sense and answer addition facts as given by the teacher with sums no greater than 10.
- The teacher should monitor for students who have a sound ordinal number sense and are able to explain the concept to the teacher and other students. The teacher should also be looking for students implementing strategies to solve basic number facts.

Extension:

- Students can create patterns with the ducks.
- Students can use the ducks to create piles of two's, five's, and ten's.
- The ducks should be left in the math center with the book for student use.
- Additional math fact sheets or flash cards should be available to the students to use while working with the story.

Differentiation:

- If students are struggling to understand the concepts students may begin working up to 5 and increase when they are able to successfully use ordinal numbers and addition facts up to this number.
- If students are advancing they may work with a partner and begin using ordinal and addition facts up to the number 20. Students can begin working with subtraction using their duck cut outs.

1,2, 3… to the Zoo

Another activity to promote counting skills and basic addition is the book *1, 2, 3… to the Zoo.*

Lesson Objective:
Students will be able to count up to 10. Students will practice addition facts adding up to 10.

Materials:

- Duck puppets
- Construction paper
- Crayons
- Scissors
- Pencils

Procedure:

- Students will begin with a discussion of traveling to the zoo and review ordinal numbers. The duck puppets can be used to help review ordinal numbers.
- The teacher should demonstrate the use of ordinal numbers using the order in which students sat down as an example to make it relatable to the students.
- The teacher will then read the book *1, 2, 3… to the Zoo* with a focus on ordinal numbers and counting the animals coming to the zoo.
- After reading the book with the teacher students will make their own train pictures which will feature animals from the story. This will be used for various math concepts. It will also serve to build a background of using shapes in art.
- When students have completed their trains, they will be able to retell the story using ordinal numbers and the animals from the text.
- Students will also be able to begin creating their own addition facts using various parts of their train.

Extension:
Students can write number stories using train parts and solve problems with a partner.

Differentiation:
This activity can be differentiated based on the students counting ability. Students can place train sections in order or begin using train sections for addition facts practice.

Today is Monday

After the introduction to Eric Carle and using his books for math, students will be introduced to the topic of time. Students will begin to think about the concept of time independently, with a partner and together as a whole class discussion. Time will first be introduced via days of the week. The class will brainstorm what they do on different days of the week and what makes each day different. Understanding that each week cycle is the same, students will be introduced to the book "Today is Monday" as a shared reading.

Lesson Objective:
Students will create a song to recall days of the week in order.

Procedure:

- The teacher will first begin with an introduction to the book *Today is Monday.*
- Next the book is to be read a loud. Throughout the reading students will discuss activities that are done on each day of the week.
- The days of the week are displayed in order on the board with the help of the students recall.
- Students will work in small groups to create a song out of the story. The songs will be performed in class to help students remember the days of the week and engage their learning through the use of not only literacy, but elements of music and dance as well.

Extension:

- Students can create a song book using the songs the class has created to share with families and other classes.
- Students may choose to perform other songs created by different classmates.
- Songs can be recorded and replayed for everyone to enjoy.
- Students can create a daily personal timeline for each day of the week.

Differentiation:

- Students may choose to create a poem instead of a song to share with the class.

- Students may also choose to perform a short skit for each day of the week in the correct order.

A Very Hungry Caterpillar

Students will be introduced to the topic of analyzing data and measuring in inches next. Students will begin to think about these concepts of time independently, with a partner and together as a whole class discussion. Students will be able to share past experiences and discuss how these concepts will be useful in the future.

Lesson Objectives:

- Students will begin to measure the length of a caterpillar in inches.
- Students will graph data and analyze the data to answer questions.

Materials:

- Prepared bar chart
- Post its
- Caterpillar pictures
- Ruler
- Blank bar graphs

Procedure:

- Students will go on a picture walk of "A Very Hungry Caterpillar" with the teacher to increase interest, memory, and comprehension. Class will review ordinal numbers and days of the week from previous lessons. The story will be read aloud to students. Students will answer questions using ordinal numbers and sequencing.
- After reading students will be asked to respond to the question "What is your favorite food?" The class will create a bar chart representing their favorite food.
- After the chart is complete, students will be able to answer questions based on the response of the class. Some questions include but are not limited to, what food is most popular, what food is least popular, how many people like fruit best, etc.
- Students will also practice measuring after reading the book. The teacher will review with the students that at the beginning of the story the caterpillar was very tiny and as he kept eating he kept getting bigger, just like us. The life cycle of a caterpillar can be pointed out when sequencing the size of the caterpillar and terms such as caterpillar, chrysalis, and butterfly can be used to incorporate science. Students will be given pictures of the caterpillar at various sizes and will then measure the pictures to the nearest inch.

- The teacher should be monitoring how students are measuring. Students should match the edge of the ruler to the edge of what they are measuring and begin to label their answers, which in this lesson would be inches.

Extensions:

- Students can create their own graph using class data for research and practice creating bar graphs.
- Students can make caterpillars of a certain length and a partner can check their measurements.

Differentiation:
If a student is not ready to measure in inches yet, have students sort caterpillars pictures based on size: small, medium, and large.

Pancakes, Pancakes!

After the introduction of measuring in inches students will be introduced in measuring volume using everyday measuring cups. Students will share past experiences and will be delighted to use their knowledge to create delicious pancakes with the class.

Lesson Objective:
Students will begin to measure ingredients to make pancakes.

Materials:

- Measuring cups
- Pancake ingredients
- Stove top

Procedure:

- The class will go on a picture walk of *Pancakes, Pancakes!* Students will discuss familiarity and background of cooking in the kitchen. The book *Pancakes, Pancakes!* will be read aloud.
- As the book is being read there will be special attention to parts of the story involving measurements.
- After the story is read, students will begin measuring out ingredients to make pancakes.

- Students will make the pancakes and get to enjoy their snacks. This will also be an appropriate place to discuss the food pyramid and nutrition with the students.

Extension:
Students can create "recipes" for foods of their choice using their new knowledge of measuring terms.

Differentiation:
If students are not ready to begin measuring more practice with measuring cups should be available using water or sand. Students can start with measurements they are familiar with using common kitchen items. More measuring instruments can be added as students gain mastery.

Culminating Activity: Closure to Carle

For the end of the unit students will be creating a book inspired by Eric Carl. Students will be able to work independently or in pairs to complete the activity. This project will demonstrate what the students have learned about the topic while also incorporating similarities to the work of Eric Carl. The books students make will be kept in the student library as well as presented for a culminating activity.

Lesson Objective:
Students will demonstrate an understanding of Eric Carle's work and the aforementioned math concepts through creating a book to be shared with others.

Materials:
- Eric Carle books
- Mixed medias
- Paper
- Crayons/markers

Procedure:
Students will choose a time frame (days or hours) to begin their writing process. Eric Carle's books will be accessible to the children to help guide their preference. Students will create a brainstorming web to begin organizing their ideas. Once a time frame and plot have been decided, students can be begin the writing process. During this process students will meet with peers and the teacher to edit their work to create a final copy. Books will be bound and illustrated for durability. Families of the students will be invited into the classroom to view all of the Eric Carl related work the students have done and to participate themselves in the activities the students completed.

Standards

The Core Curriculum of the School District of Philadelphia is aligned to Pennsylvania's academic standards. The standards listed below are a brief listing of some of the standards that will be addressed in the unit. The standards were taken directly from the first grade curriculum posted on the school districts web site.

2.3.1.D: Tell time (analog and digital) to the minute.

2.3.1.D.1: Tell time to the nearest hour and half-hour using analog and digital clocks.

2.3.1.G: Estimate and verify measurements.

2.3.1.G.1: Estimate and measure objects using nonstandard units.

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Teacher Resources

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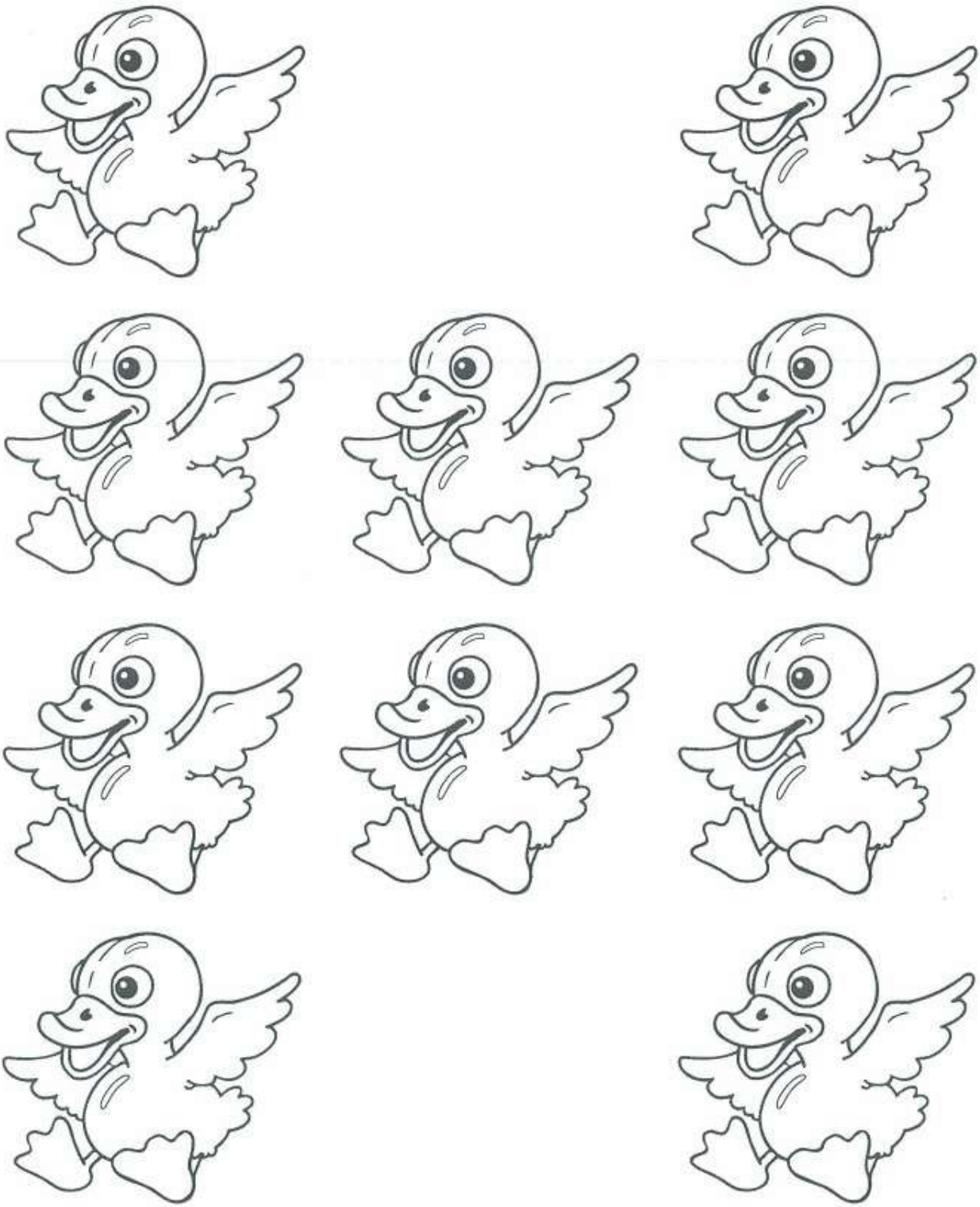
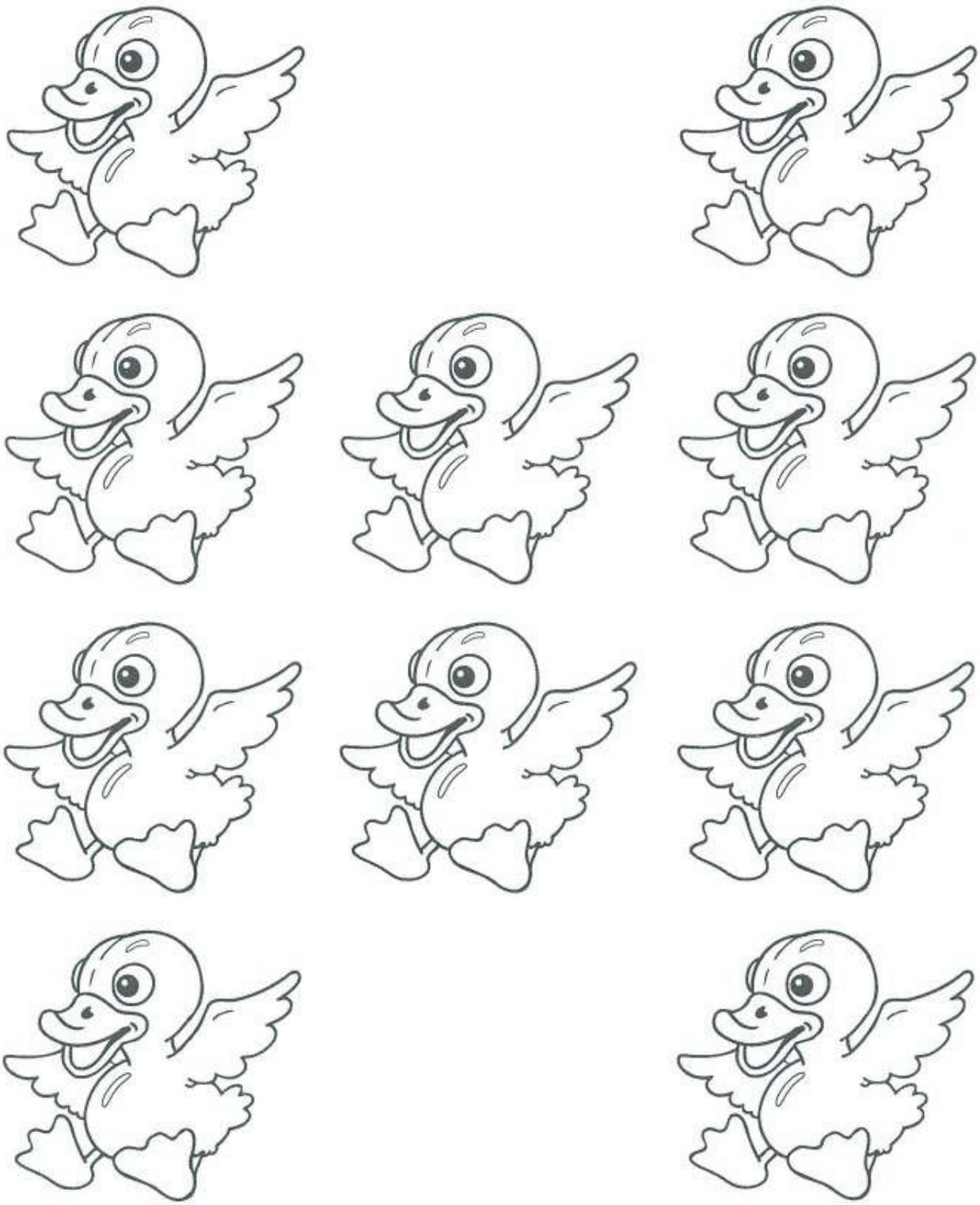
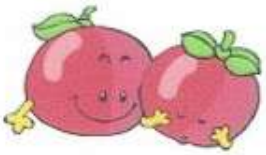
Rubber Duck



Rubber Duck



Name:_____ Date:_____ Printfreecards.net



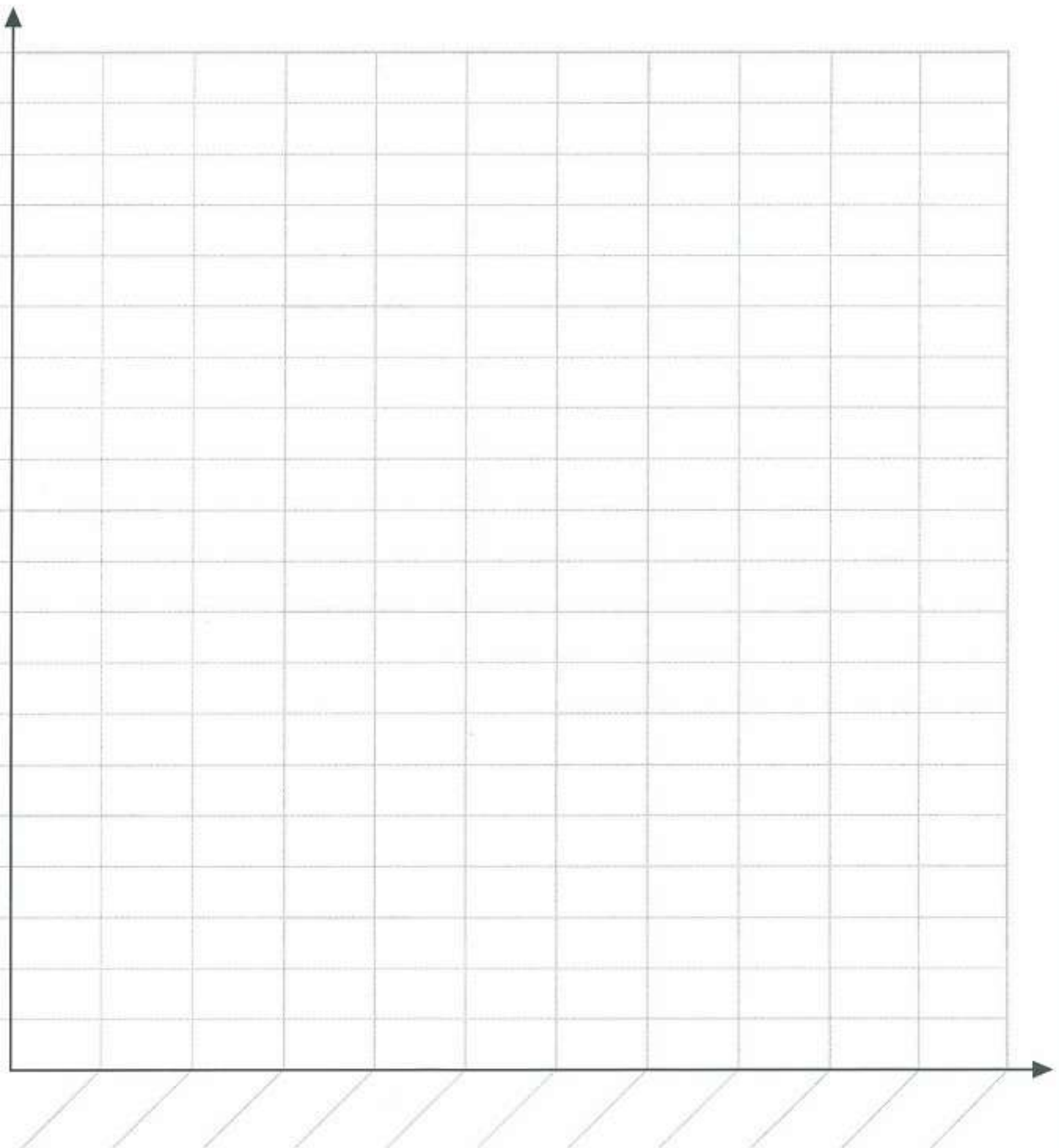
Single-Digit Addition - No Regrouping

6 + 4 ----	2 + 1 ----	9 + 0 ----	1 + 1 ----
7 + 2 ----	4 + 2 ----	7 + 0 ----	5 + 2 ----
3 + 3 ----	4 + 2 ----	3 + 0 ----	6 + 2 ----
8 + 1 ----	4 + 4 ----	6 + 0 ----	1 + 2 ----
4 + 2 ----	6 + 1 ----	4 + 0 ----	3 + 1 ----

Name: _____

Bar Graphing

Title: _____

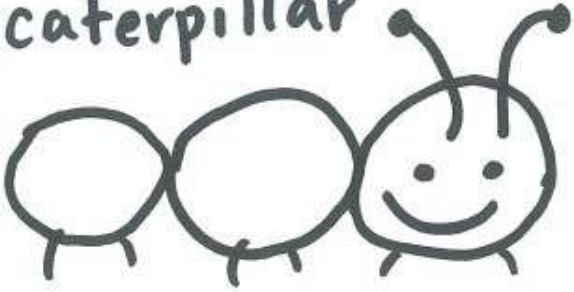


y-axis: _____

x-axis: _____

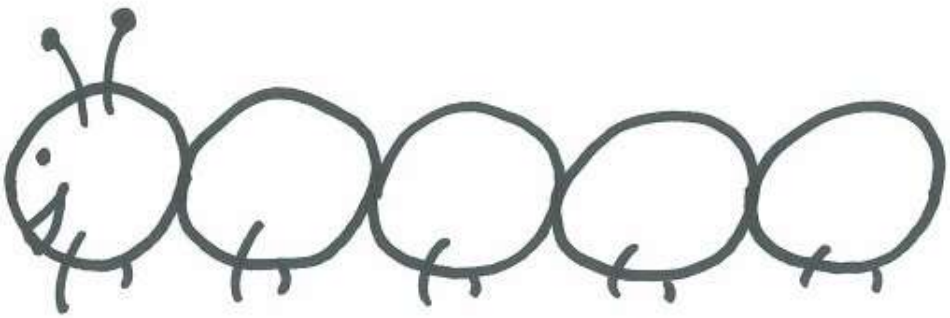
Measure Up!

Use your ruler to measure each caterpillar using <u>inches</u>.

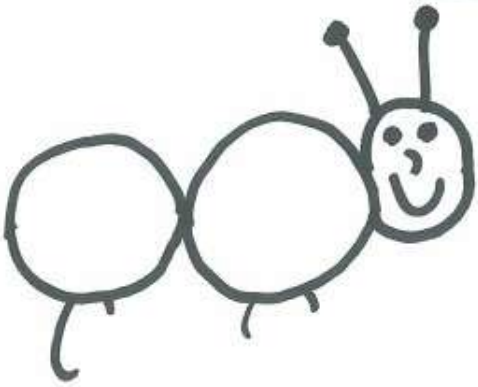


____ inches

____ inches



____ inches



Challenge!

____ inches

Cut and sort caterpillars:

small medium big