

# Ray's for Today

## Level 1 Instructor's Manual

Lori Horton Coeman and Joyce Bohn



## A NOTE ON PRONOUNS:

In this series we opt to use the masculine form of the pronouns (him, his) when referring to the student.

- This follows the traditional generic use of the noun *mankind* to refer to all members of the human race, no matter what their gender.
- It avoids the awkward practice of using both the feminine and masculine pronouns, such as “he or she will count the coins.”
- It likewise avoids the jarring practice of using the feminine pronoun in one sentence and then switching to the masculine pronoun in another sentence, or switching the pronouns in every other lesson.
- Since the lessons are written to the students, the pronouns aren’t used in the lessons. We only follow this format in the Instructor’s Manual, so it will not influence your child in any way or imply any sense of masculine predominance in the subject of arithmetic.

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## **ANSWER KEY**

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## RAY'S FOR TODAY

The *Ray's for Today* textbooks may not look like the original small brown books of *Ray's New Arithmetic* series. But the content is very much the same. Almost all of the problems in the original are included.

Since the original books were used in a group classroom situation, often with multiple grades in one room, they did not include the teaching information. The teacher would present the lessons on the blackboard at the front of the room and the students would copy them on their own slates at their desks. Much of the day's lesson involved the teacher giving problems that the students answered orally.

What we've added to these textbooks is our effort to recreate that presentation in an age-appropriate manner in the Student Text, while still keeping the focus on oral language and mental math. Research has shown that this proven approach helps children develop patterns of thinking that enable them to handle mathematical concepts, such as place value and commutativity, without even realizing it.

As you go through the lessons with your child, you will be able to recognize what is being taught. The teacher's guide will give you any background information that is necessary and will spell out for you exactly what math skills are being taught as well as how to present them. You have at your fingertips what the classroom teacher knew as he or she presented the lessons to the class.

## OUR PURPOSE

Welcome to the Ultimate Math Journey! As with the original Ray's series, we're headed on a course to reach a *deep understanding* of math. We want children to see that numbers make sense.

To do so, they need to see the relationship between objects, word descriptions, symbols, and reasoning. By traveling from real-world experiences to visuals and models, to symbols, and abstract reasoning, we can make the sequential road of mathematics feasible for any child and learning style.

## WHY THIS JOURNEY?

Here's how one of the nation's most respected math educators, former classroom teacher Kathy Richardson, put it:

*When children are taught mathematical concepts or procedures before they reach certain levels of thinking, they do not see the underlying logic of mathematics they are working with. All they can do is memorize processes and procedures. It may appear that they know the mathematics, but in reality, this is just an illusion. What they have learned is not useful to them because they cannot build on it. This 'illusion of learning' breaks down at the point where true understanding is necessary for further growth. If we look only at the ability to get right answers, we miss the information needed to determine what children know and still need to learn. The result is that children spend valuable instructional time trying to memorize what doesn't make sense to them, instead of developing the understandings they need.*

Our goal is not to rush students through the math sequence but to equip them with arithmetic skills and thinking skills that will serve them well in real life and in any career. We want students to "get it" no matter what their learning style, pace, or natural math ability.

## DESTINATION POINTS OF INTEREST

- ❖ The more senses we can use in learning, the more likely it will stick—multi-sensory learning. We use auditory, visual, and hands-on manipulatives and models to show the skill or concept. This step is **ESSENTIAL** for building a firm foundation of understanding. Please do **NOT** skip this step.
- ❖ The more ways children can connect to a concept, the more likely it will stick—experiential learning. Whenever possible, lessons begin with a real-life example that children commonly experience. Then the concept is shown first with household objects and resources that the children can handle, and then with pictures and drawings as the parent/teacher explains the skill orally. The parent and child do the lesson together orally, using whatever resources are required to understand the concept. A series of practice exercises help cement the learning. We purposely kept the lessons short so that you have the time to go through this process.



- ❖ This follows the natural path of learning from the concrete to the abstract. Natural learning moves from real-life experiences, to concrete learning using familiar objects, to visual representations, to symbolic representations (number symbols that represent abstract operations). Here's how that process might look.



- ❖ This establishes a foundation of learning that allows the student to build a thorough knowledge of math based on the four stages of information processing or “knowing”. Students are *exposed* to the idea from real life using as many senses as possible, so they can *recognize* the skill or concept, in order to understand how to do it and why it works, *practicing* until they are so *intimately acquainted* with it that they can use it automatically in several applications.
- ❖ The focus is on gaining experience with our number system. This experience centers on interacting with the material in such a way that cements learning, rather than doing lots of busywork. Questions are posed during the lesson to help you see if your child is grasping the concept. Most lessons will have a few exercises for the child to complete, but these are kept to a minimum in order to leave time for the interactions that show why the concept works and not just learning how to do the skill by rote memory. If a skill is not used often, the memory fades; when a child understands why it works this way, it is easier to recall later.

## YOUR ROLE

The parent/teacher serves as the Tour Guide who makes sure your Tourist (child) sees everything there is to see along the way. We want each student to have that “aha moment” when he or she “gets it.”

So, particularly in the early going, you will be traveling right alongside your child. This may seem like a lot of extra effort on your part, but it will be worth it in the long run. You will actually be saving yourself and your child time and aggravation down the road. We kept the daily lessons short so that the learning journey doesn't consume a lot of your time.

The Instructor's Manual includes the information you will need for this journey, including a suggested way to present the lesson. While you do not have to use the exact wording, the dialogue should stay as close as possible to the method described.

The lessons are written to the students, as if they can read it themselves. This helps to involve the students and give them a sense of ownership. Your children are not expected to be able to read the lesson. **Nor are they expected to write the words or number problems even though the lesson says to do so. The lesson assumes that the child and parent/teacher are working together, with the teacher modeling the skill as it is introduced.**

The lesson contains both teaching information and step-by-step instructions for the hands-on learning activities; be sure to pause when a question is asked so your student can answer, and do the activity.

The lessons use the To-With-By approach when teaching skills. The parent/teacher introduces the skill TO the child. The parent/teacher works WITH the child, doing it together, until the child is able to do the skill BY himself. Since children can vary greatly in terms of readiness, learning style, and the development of the fine motor skills needed for printing, the amount of time needed to work WITH the child will vary. This does not reflect ability or intelligence. It only reflects readiness.

## LEARNING OBJECTIVES

The Ray's Arithmetic series was written before grade levels were used. The textbooks taught math skills in sequence, dividing the books into skill levels instead of grades. Students moved through the levels (textbooks) as they mastered the skills. They didn't go on to the next book just because the academic calendar changed. Students had to show a certain level of proficiency before moving to the next book.

Because math is a sequential subject where the topics build on what has been learned previously, this proficiency is absolutely essential. Otherwise, students cannot fully understand the reasoning behind the next skill. **This is**

**why we stress learning the skill rather than completing the course.** Nothing is gained by pushing your child through the lessons.

Since most families are used to thinking in terms of grade levels, we have set up Ray's for Today to generally coincide with standard grade levels. This helps families who must fulfill state requirements by grade levels. However, if your child has not yet mastered the skills in the first level, do not push ahead to the second level just because the child is going into second grade. Review the skills until the child has that "aha moment" and "gets it."

The *Scope & Sequence* of this program varies somewhat from the typical approach. This is because we are focusing on building concrete understanding first. Once this foundation is in place, it is easier and more efficient to teach subsequent skills. All necessary and typical math skills will be covered eventually. So don't panic that your first grader is not doing multi-digit addition and subtraction with regrouping. Your child will learn this after there is a thorough understanding of place value and how our number system works.

In the long run, your child will be better prepared for working with different types of numbers such as decimals, percents, and fractions, and better equipped for applying arithmetic skills to more abstract concepts such as algebra and geometry.

The main learning objectives for the first level of *Ray's for Today* are to:

- learn how to read, write, and count the numbers through 100
- learn how to add and subtract numbers with sums up to 20 (the addition and subtraction fact families for the numbers 1 through 10)



## PACKING LIST

In order to help your children reach this deep understanding of math, you will need to use manipulatives or hands-on models and visuals. You will save yourself a lot of time and trouble if you get a storage container or box and keep these materials together in a handy location. Most of manipulatives used in the program are available for purchase. If you choose to use common household items instead, that is fine, but we do suggest that you keep them stored in the box if at all possible. In some cases, models and visuals are made in the process of presenting the lesson. You will need to keep these in the box since they will be used over and over throughout the course. Many of the items will be used next year as well, so do not discard them.



## CEMENT MIXERS

The original Ray's texts contained pages filled with exercises that were used to drill the students orally. Often times the entire class repeated the drills together. The teaching portion of the curriculum was left out of the textbooks. It was assumed that the teachers knew how to present the lessons and how to teach the skills involved.

In the *Ray's for Today* series, we insert the teaching portion in the Student Textbook so that each lesson presents the skill(s) and gives some practice. This practice is kept to a minimum so that the child can focus on grasping the material and understanding it in context. The goal is a deep understanding of math.

We believe the oral drill is just as important to developing this deep understanding. All children, particularly in the early elementary grades, need lots of repetition in order to grasp new skills. **However, if we include all the oral drills in the Student Textbook, it would be overwhelming to the child. So we include it under the heading of "Cement Mixers" at the beginning of each unit of your Instructor's Manual for you to cover when you see fit.**

Because children develop at different rates, both physically and mentally, this allows you to adjust the curriculum to fit your particular child and his learning style. If your child breezes through the day's lesson, then you can augment it with some of these drills. If your child needs a change of pace for a day, you can use a few of these to give your child his "minimum daily requirement" of the essential math "vitamins."

Otherwise, you can use these for separate, short, oral drills later in the day or they can be incorporated into your week—even when "school" isn't "officially" in session. The expectation is that by the time the academic year and the summer review has ended, all of these drills will have been used at least once.

The purpose of these oral exercises is to cement the skills in each unit into your child's long-term memory. When a child can do the math "in his head," he's got it. If your child needs to use a scrap piece of paper, that's all right. But try to work toward oral mastery if possible.

Here's why. We are building for the future. Too often students get bogged down in upper level math courses because they have not mastered the "mechanics" of math—the arithmetic operations. As a result, they have trouble grasping the new concepts or advanced applications such as algebra.

It's the same as reading. Some children don't comprehend what they are reading because they are still so focused on the mechanics of reading—the sound/letter connections and sounding out the words—that they lose the flow of meaning. We want the math facts and arithmetic operations to "flow naturally" so your child can focus on understanding upper level math.

"Cement mixers" are listed at the beginning of each unit, with suggestions as to when to use them. The brain pays more attention, and therefore retains the material better, when the drill is broken up into smaller segments. For instance, the lesson can be done during the morning and then the drills in the afternoon.

## ASSESSMENT

The traditional *Ray's New Test Examples in Arithmetic*, which contains sample problems for testing, starts at grade 3. So there are no formal tests at this level.

For educational systems and homeschoolers in states that require testing and grades, we have included unit reviews that can function as cumulative tests. We highly recommend that for young children, these assessments be "graded" as any other daily lesson. Divide the total number correct by the total number of problems in each lesson, and assign a percentage score for grading. The grade awarded will depend on the grading scale you use.

Throughout the Teacher's Guide, you will see a Mile Marker icon with a list of benchmark skills that you can use to evaluate a student's grasp of the material. At the beginning of each unit, there is a Where You Are Headed icon with a list of the skills covered in each unit. These are usually separated into essential skills, additional skills, and supplementary skills.

- Essential skills are the baseline skills that will need to be grasped in order to keep moving forward in the curriculum. The goal is for students to show strong proficiency with these skills, if not mastery.
- Additional skills are skills that are related to the baseline skills that can be practiced at this stage. The goal is for students to gain practice in these skills, building toward proficiency in the next grade. Students should be growing in their proficiency of these skills.
- Supplementary skills are skills that apply the baseline skills to everyday life. The goal is to expose the students to these skills so that they can be applied more readily in subsequent grades.

The Parent/Teacher can use these three levels to:

- ✓ evaluate whether additional practice and review are needed throughout the rest of the day or week.
- ✓ slow down the pace, allowing for more interaction with the concepts involved.
- ✓ determine what skills should be practiced over the summer.

Primary-aged children vary greatly in the skills they are ready to learn. You may find your child is cruising along in the program and then hits a wall with a specific lesson. Don't panic. If it seems too difficult for your child to grasp, skip it for now. Every skill will be covered across several years, so your child will not miss out. The skills presented in this Level cover a typical scope and sequence for this grade. But just because it is typical doesn't mean every skill fits your child. There is no "one-size-fits-all" curriculum program. Use your discretion as to whether or not your child is ready.

Definitions and Principles are set off in boxes. The student is not expected to master these. These should be read as part of the lesson. Our goal is exposure only. They are included in the Glossary at the back of the student book.

## **RAY'S FOR TODAY – LEVEL 1 SCOPE & SEQUENCE**

The main learning objectives for the first level of Ray's for Today are to:

- learn how to read, write, and count the numbers under 100
- learn how to add and subtract numbers with sums up to 20 (the addition and subtraction fact families for the numbers 1 through 10)

### **NUMBER CONCEPTS**

Counting objects  
Writing numbers  
Recognizing number words  
Counting from 1-100  
Counting on from a given number  
Sequence of numbers  
One more, one less  
Ordering numbers  
Skip-counting  
Hundred Chart  
Ordinals  
Zero

### **ARITHMETIC OPERATIONS**

Adding more to a number by counting on  
Addition fact family to ten  
Addition number bonds  
Addition story problems  
Adding more than two numbers  
Subtracting from a number by counting backwards  
Subtraction fact family to ten  
Subtraction number bonds  
Subtraction story problems  
Subtracting more than two numbers  
Mixed practice story problems (addition/subtraction)  
Recognizing and using plus sign, minus sign, and equals sign

### **MONEY**

Recognizing and counting coins (pennies, nickels, dimes, quarters, half-dollars)  
Recognizing a dollar bill  
Recognizing the number of each coin needed to make one dollar  
Relationship of price and money  
Matching money to prices  
Recognizing sufficient amount  
Determining which coins to use  
Recognizing if change is necessary  
Recognizing and using signs for cents and dollar  
Money story problems

## **TIME**

Calendar – days of week, months of year, yesterday/today/tomorrow, seasons, number of days in a month/year

Time periods in the day: morning, noon, afternoon, evening, night, midnight

Standard and analog clock

Telling time to hour, half hour, quarter hour, five-minute intervals, in minutes

AM/PM

Writing the time

## **FRACTIONS**

Parts of a whole

Equal parts and fair shares

Halves, thirds, fourths

Identifying fractional parts of a figure

Writing fractions

## **MEASUREMENT**

Non-customary measures

Customary measures of length: inch, foot, yard

Customary measures of weight: pounds

Customary measures of liquid capacity: cup, pint, gallon

Customary measures of temperature: Fahrenheit

Using a ruler, yardstick, measuring tape

Selecting the proper measurement tool

## **GEOMETRIC SHAPES**

Recognizing basic flat shapes: square, rectangle, circle, triangle

Recognizing basic solid shapes: cube, rectangular prism, sphere, cone

## **GRAPHING**

Tallies

Pictograph

Bar graph

## **PROBLEM-SOLVING**

Joining

Removing

Joining and removing

Using models and visual representations

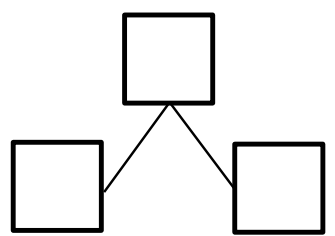
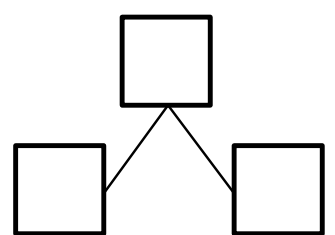
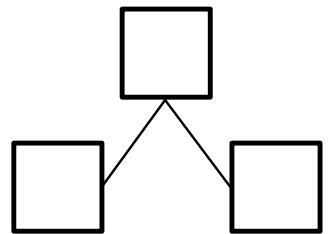
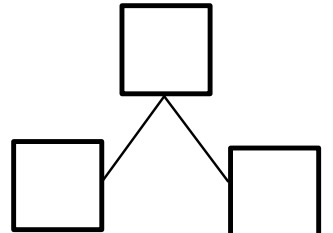
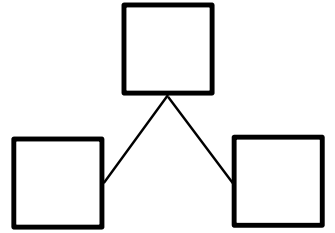
Breaking a problem down into steps

Age problems

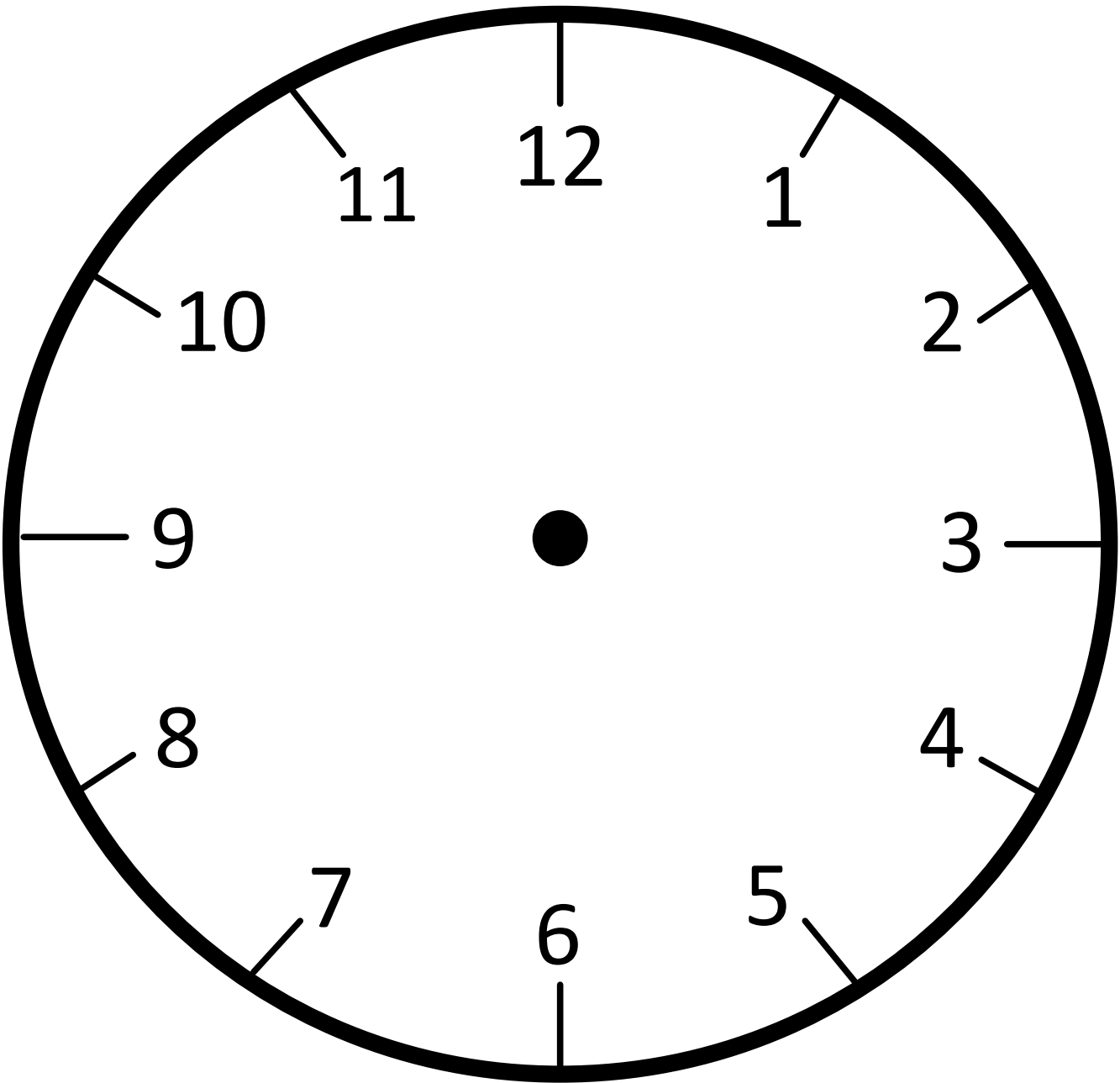
Two-part problems

Analyzing a story problem

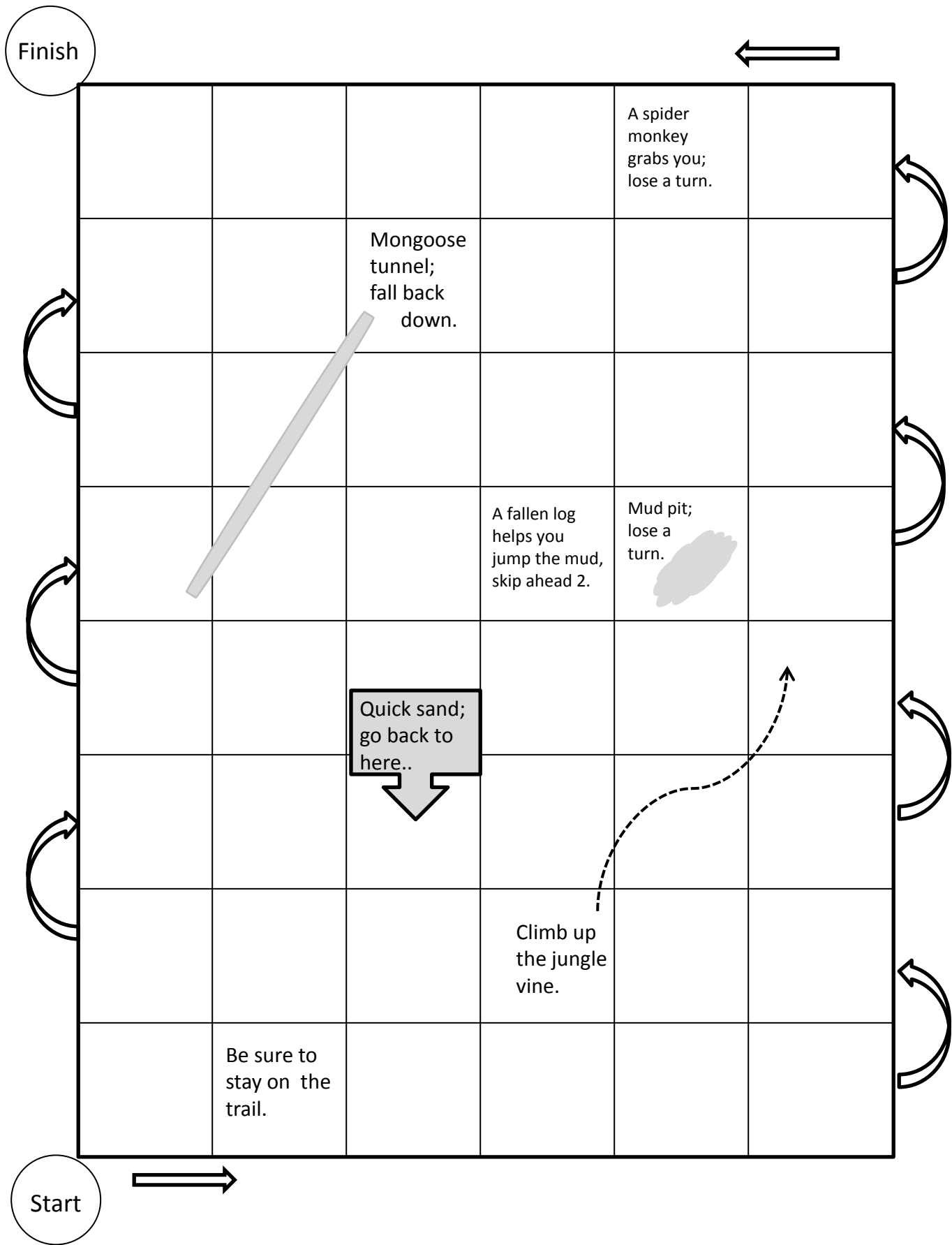
# Addition/Subtraction Number Bond Worksheet



Clock Face Template - Five-Minute Intervals



# Math Jungle Game Board

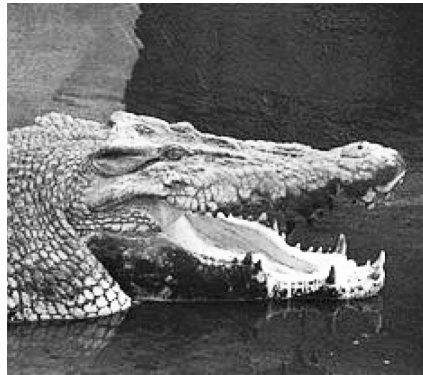




# Math Jungle Animals



jaguar



crocodile



sloth



tapir



spider monkey



tree boa



anteater



tree frog



ocelot