

Representational (Picture/Drawing)

Level Instruction

Math Skill/Concept: Identifying fractional parts and writing fractions.

Prerequisite Skills:

1.) Identify fractional parts and wholes using area model, measurement model, and sets model (if appropriate) concrete materials.

Learning Objectives:

1.) Draw representations of fractional parts and write fractions.

Important Ideas for Implementing this Instructional Plan

1.) When teaching how to draw fractions, some students may prefer to draw circles while others will prefer to draw rectangles. Although you should teach several different methods, allow students to choose the drawing method that is easiest and most efficient for them.

2.) Student drawings do not need to be exact! Although they will be drawing fractional parts that are proportional in size, students with writing problems will have difficulty making their drawings exact. Emphasis should be placed on the meaning of their drawings, not the drawings themselves.

3.) By drawing fractions they previously identified with concrete materials, students will experience a very important "intermediate" transition from concrete understanding to eventual abstract understanding. Do not rush through this phase of instruction, since many students with learning problems greatly benefit from solidifying their concrete understanding of fractions by drawing them.

Instructional Phase 1: Initial Acquisition of Skill/Concept – Teacher Directed Instruction

Teach Skill/Concept within Authentic Context

The same variety of authentic contexts used at the concrete level of instruction are continued at the representational level. Explicitly link authentic contexts taught at the concrete level to drawing experiences.

Build Meaningful Student Connections

Purpose: to assist students to make meaningful connections between what they know about representing fractional parts with concrete materials to drawing pictures that represent the concrete materials they have used.

Learning Objective 1: Draw representations of fractional parts and write fractions.

Materials:

Teacher -

- concrete materials that represent Area, Measurement, & Sets Model and which students previously used during concrete level instruction
- a visual that depicts the skill students will learn
- candy bar
- chalkboard/dry-erase board/overhead
- chalk/markers/pens for writing

Description:

1.) Link to student's prior knowledge & experiences

- Remind students they know how to show wholes and parts of wholes using a variety of material.
- use concrete materials students have previously used and which represent the Area, Measurement, & Sets models to model this.
- have students name the fractional parts as you demonstrate several using each of the types of concrete materials.

2.) Identify the skill students will learn

For Example:

During the last few days you have learned to represent parts and wholes using different kinds of materials, and you've learned the special names we have for certain parts. Today we are going to learn how to draw pictures to represent parts and wholes as well as the special names for certain parts.

- Provide some type of visual that represents the words you are saying (e.g. a short written phrase or two that reflects the learning objective, or a picture that represents the learning objective.)

3.) Provide rationale/meaning for learning the skill

For Example:

We've already talked about why learning how to break things into equal parts is a really important thing to be able to do. Like we talked about before, you may have something that you want to share with one or more friends. It is helpful to know how to break them into equal parts so each friend gets the same amount. Remember our candy bar example? Maybe you have a candy bar and you want to share it with a friend. Knowing how to break it into equal parts will allow you to share it with your friend.

We also brainstormed some ideas about other objects we might want to break into equal parts. Who remembers some examples?

- prompt students to remember some of the objects they previously listed (e.g. pizza, sets of cards, etc.)

Well, by learning to draw parts and wholes, we will have a way to decide how to break things into parts before we actually do it. Sometimes we may break something into parts and not get the parts equal. Drawing a picture first helps me keep this from happening. I can look at the picture I drew and seeing where to break the object so that I get equal parts. Let me show you what I mean...

- use a candy bar as an example. Draw a rectangle that represents the candy bar and which has similar dimensions. Say you want to cut it into two equal pieces. Draw a line that separates the rectangle into two equal pieces, then demonstrate how you can use the picture to help you decide where to break the candy bar into two equal pieces.

Provide Explicit Teacher Modeling

Purpose: to provide students a teacher model who clearly demonstrates how to draw fractional parts, how to write fractions using numbers and symbols, and the meaning of the numbers and symbols in a written fraction.

Learning Objective 1: Draw representations of fractional parts and write fractions.

* The Area and Measurement Models are used to teach drawing fractional parts. The Sets Model is not included at the representational/drawing level of instruction because drawing fractional parts with sets of objects involves an understanding of the division process, something not introduced to this point. After students have learned to draw fractional parts using Area and/or Measurement Models you may choose to teach students how to pick out pictures of objects already grouped into sets that represent fractional parts.

Materials:

Teacher –

- appropriate concrete materials that represent the Area and Measurement Models
- a visible platform for showing the concrete materials
- a visible platform to draw fractional parts, to write the language of fractional parts, and to write fractions
- chalk, overhead pens, dry-erase markers for drawing and writing

Description:

A. Break down the skill drawing fractional parts and writing fractions into learnable parts.

- 1.) Remodel representing fraction using concrete materials that represent the Area and Measurement Models
- 2.) Draw pictures that represent the fraction using the Area and Measurement Models.
3. Write the fractions (relate to concrete materials, drawings, and language)

B. Explicitly demonstrate and model how to draw fractional parts and write fractions.

1. Re-model with concrete objects that represent both Area & Measurement Models

For Example:

Let's represent 'one-half' with circle pieces. (Model 'one-half' by placing a circle piece down and laying a different colored 'one-half' piece over it.) We can also represent 'one-half' with Cuisenaire rods. (Model 'one-half' by laying a 'whole' rod down and then laying a 'one-half' rod on top of it.) We can do the same thing for 'one-fourth' and 'one-eighth.' (Model both fractional parts using circle pieces and cuisenaire rods).

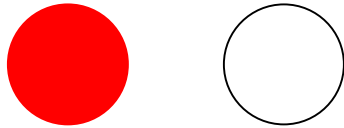
2. Model drawing pictures that represent both Area & Measurement Models

- *Area Model*

For Example:

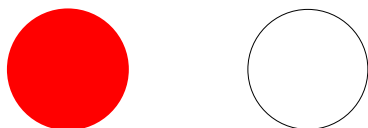
Now, I'm going to show you how to represent 'one-half,' 'one-fourth,' and 'one-eighth' by drawing pictures. I'll teach you to draw pictures that look a lot like circle pieces, cuisenaire rods, and other objects. I'll draw 'one-half' first. First, I'll show one-half again with circle pieces. (Represent 'one-half' with circle pieces.) Hmm, I wonder how I can draw what I see with fraction circles. Well, I've got a whole circle (Point to and move your finger around the circle piece.) I can represent it by drawing a circle. I'll do that now. (Draw a circle in a manner that is visible to all students. *If possible, draw next to the concrete objects so students can easily compare the two.) Ok, I've drawn a circle that represents the circle piece I have here (Point to the drawn circle and then to the circle piece).

For Example:



But the circle represents one whole, not 'one-half.'" Let me look at the circle pieces again. I've drawn the circle piece (Point to and move your finger around the circle piece), I wonder how I can draw the piece that represents 'one-half.'" Hmm, I know, I can see the 'one-half' piece is a darker color than the circle piece. I can kind of see a line where the dark color of the 'one-half' piece meets the lighter color of the circle piece. (Point to the division between the 'one-half' piece and the circle piece and run your finger across the line from one side to the other side.) I can represent this line by drawing a line that separates the circle I drew into two equal parts. I'll do that now. (Draw a line that separates the circle into two equal parts.)

For Example:





Ok, now that I've drawn the line that cuts the whole circle into two equal parts, I need to do something that will show one of the two equal parts. Hmm, let me look at the circle pieces again. Oh, yea! The 'one-half' piece is a darker color. Hey, I can show that with my drawing by shading in one of the two parts I've made with my line. I'll do that now. (Shade in the half of the circle that corresponds to the 'one-half' piece covering the circle piece.) Let me look at my drawing. Hmm, it does look like the circle pieces. I have a circle. This is like my circle piece. (Point to the circle you have drawn and then to the circle piece. Move your finger around each as you point to them.) I've also represented my 'one-half' piece by drawing a line that separated my circle into two equal parts. Just like the circle pieces. (Point to the "line" of the drawing and the "line" on the circle pieces where the shading/color demarcates end of 'one-half'.) And, I have shaded one of the two equal parts in my drawing that represents 'one-half.' Shading this part in looks like the 'one-half' circle piece.

- *Measurement Model*

For Example:

Now, let me try drawing one-half another way. I used circle pieces before to help me. I think I'll use fraction strips (or other measurement manipulative). Let me represent 'one-half' using these fraction pieces..... (Continue the same explicit modeling process described above to model how to draw one-half using fraction strips. *Draw a rectangle that simulates a 'whole' fraction strip, then draw a line that separates it into equal parts, then shade one of the equal parts.)

3.) Write the fraction by explicitly relating concrete materials, picture and language to its number/symbol representation.

- Model writing the number/symbol representation given both concrete materials and drawings and its meaning

For Example:

Now that we know how to draw parts like 'one-half,' 'one-fourth,' and 'one-eighth,' I want to show you a way to write 'one-half,' 'one-fourth,' and 'one-eighth' using numbers and a special symbol. Let's take a look at 'one-half.' (Show 'one-half' using circle pieces or another Area or Measurement Model material.) There are two ways we have learned to describe what these circle pieces represent. What is one way we can describe what these circle pieces represent? (Elicit the response, 'one-half,' or the response, 'one of two equal parts'.) That's right. Good job of remembering that. I'll write that so we can all read it. (Write the

appropriate language in a place visible to all students.) What is the other way we have learned to describe what these circle pieces represent? (Elicit the response, 'one-half,' or the response, 'one of two equal parts.')

That's right. Good job of remembering the second way. I'll write that so we can all read it. (Write the appropriate language in a place visible to all students.)

For Example:

one of two equal parts one-half

So we know two ways to describe these circle pieces. What are they? (Elicit the response, 'one-half' and the response, 'one of two equal parts.')

Great. Now I'm going to show you a third way to describe these circle pieces. I'm going to do these by writing two numbers and a special symbol. I'll do that now. Hmm, I have one part (Point to the 'one-half' piece). I can represent that with the number "one." (Write the number '1' directly under the "one" in the phrase "one of two equal parts")

For Example:

one of two equal parts one-half

1

I have one part and I can represent that one part with the number "one." The number "one" stands for the 'one' written on the board. Now, if I placed another 'one-half' piece next to the 'one-half' piece I already have, the 'two one-half' pieces would make a whole circle. Therefore, I know I have one of the two 'one-half' pieces I would need to make a 'whole' circle. Hmm, I wonder how I can represent that this one 'one-half' piece, or this one part, is actually one part of two equal parts that make a whole circle? I represented the 'one' in "one of two equal parts" with the number "one." I can represent the 'two equal parts' by writing the number "two." I'll do that now. (Write the number '2' under the "two" in the written phrase "one of two equal parts.")

For Example:

one of two equal parts one-half

1 2

I've represented the "one" and the "two equal parts" in the phrase "one of two equal parts." However, I still have one more part of the phrase that I need to represent. I need something to represent the word "of." (Point to the word "of" in the phrase "one of two equal parts.") The word "of" is very important because it lets us know that we have one part *of* two equal parts. (Hold up the 'one-half' piece and then two 'one-half' pieces together to show a whole circle.) I told you before that I was going to show you a special symbol (mark). This special symbol represents the "of" in the phrase "one of two equal parts." I'll show you the special symbol now. (Write the '/' symbol under the word "of" in the phrase "one of two equal parts.")

For Example:

one of two equal parts one-half

1 / 2

This way to describe "one of two equal parts" is quicker than writing out the words. It also can be used instead of the words "one-half." (Write '1/2' under the words "one-half.")

For Example:

one of two equal parts one-half

1 / 2

1 / 2

- Prompt student thinking to say what the written fraction represents.

For Example:

In fact, this is what we call this symbol (Point to '1/2:'). We call it 'one-half.' Everybody say the name for this symbol. (Prompt students to say 'one-half' with you as you point to '1/2.' *Have students repeat this several times. Now that we know the numbers and the special symbol for representing 'one of two equal parts', or 'one-half', its important that we always remember what the numbers and the special symbol stand for. Let's review what they stand for. What does the number "one" stand for? (Point to the '1' and the word "one" and elicit the response, "the one part of two equal parts/one-half circle piece.") Yes. The number "one" represents the one part or the 'one-half' circle piece. (Hold up the 'one-half' circle piece.) And what does the number "two" stand for? (Point to the '2' and the words "two equal parts" and elicit the response, "the two equal parts that make up the whole circle." *Emphasize that the point that the two equal parts make up a 'whole' circle.) That's right, the number "two" represents the two equal parts that make a whole circle. (Hold up two 'one-half' pieces and show how they make a whole circle.) Now, what does this symbol mean? (Point to the '/' symbol and the word "of" and elicit the response, "it means 'of.'") That's right, this symbol means "of." Now, I'll read the number symbol and say what the numbers stands for and what the special symbol stands for. (Point to the '1:.) One (Point to the '/' symbol.) of (Point to the '2:.) two equal parts. Everybody, do that with me this time. (Point to each number and symbol and say aloud with the students what they stand for.)

4. Model writing the number/symbol representation for other fractions given both concrete materials and drawings and its meaning

*Repeat the same process described above

IV. Scaffold Instruction

Purpose: to provide students a teacher supported transition from seeing and hearing the teacher demonstrate/model drawing fractional parts and writing fractions to performing the skills independently. It also provides the teacher opportunities to check student understanding so she/he can provide more modeling cueing if needed *before* students practice independently.

Materials:

Teacher –

- concrete materials that represent Area and Measurement Models
- a visible platform for drawing fractional parts and for writing fractions
- chalk, overhead pens, dry-erase marker for drawing and writing fractions

Students –

- paper and pencil for drawing fractional parts and writing fractions

Description:

The steps for Scaffolding your instruction are the same for each concept you have explicitly modeled. This teaching plan provides you one detailed example of scaffolding instruction for one of the concepts presented during Explicit Teacher Modeling.

A. Drawing 'One-Half,' 'One-Fourth,' & 'One-Eighth' Using Area & Measurement Drawing Models

1.) Scaffold Using a High Level of Teacher Direction/Support

a. Choose one or two places in the problem-solving sequence to invite student responses. Have these choices in mind before you begin scaffolding instruction. (Choices are shown in red).

*Follow this process for at least two ways of drawing fractional parts (e.g. circles and rectangles/bars). As students begin drawing fractional parts independently, they can choose which way is easiest or most efficient for them. Also, include each of the fractional parts you modeled during this phase of scaffolding (e.g. 'one-half,' 'one-fourth,' & 'one-eighth.')

For Example:

- Remind students of the pizza or dog leash story situation used from Explicit Teacher Modeling at the concrete level.
- Decide which "type" of drawing you will use (e.g. circles, rectangles/bars, etc.) and relate your choice to actual concrete material. Also relate why you chose this type of drawing.
- Think of what the concrete material looks like – "Hmm, 'one-half' can be represented by a circle with a 'one-half' piece on top.
- **Think of what the concrete material looks like – "Hmm, what does 'one-half' look like with circle pieces? (Elicit the response, 'one-half' can be represented by a circle with a 'one-half' piece on**

top.) Great. 'One-half can be represented by a circle with a 'one-half' piece on top. Thanks for helping me out."

- Think of how to draw the "part" – "How can I draw the 'part' or 'one-half'? Oh yea, I can draw a line first that separates the whole circle into two equal parts."
 - Draw the line(s) that represent the fractional part. – "Now I have two equal parts, but what I need to represent is one of the two equal parts, or 'one-half'. How can I do that? Let's see, I know with my circle pieces, the 'one-half' piece is a darker color than the circle piece. Ok, I can shade in one of the parts."
 - Shade in the appropriate "part" that represents the fractional part.
 - Teacher asks questions/Teacher answers questions about the drawing and its relationship to the concrete material and the fractional part.
 - "Do I have my whole represented? (Elicit the response, "Yes, you drew a circle that represents the whole circle when we use circle pieces.") That's right, the circle I drew represents a 'whole' circle piece."
 - Do I have the part represented? – "Yes, I drew a line to separate the whole circle into two equal parts and then I shaded in one part."
 - Does my drawing represent 'one-half'? – "Yes, I have a whole circle cut into two equal parts and one part is shaded. The part that is shaded represents 'one-half' of the whole circle."
- a. Maintain high level of teacher direction/support for another example if students demonstrate misunderstanding/non-understanding; move to a medium level of teacher direction/support if students respond appropriately to the selected questions/prompts.

2.) Scaffold Using a Medium Level of Teacher Direction/Support

- a. Choose several more places in the problem-solving sequence to invite student responses. Have these choices in mind before you begin scaffolding instruction.

For Example:

- Remind students of the pizza or dog leash story situation used from Explicit Teacher Modeling at the concrete level.
- Decide which "type" of drawing you will use (e.g. circles, rectangles/bars, etc.) and relate your choice to actual concrete material. Also relate why you chose this type of drawing.
- Think of what the concrete material looks like – "Hmm, what does 'one-half' look like with circle pieces? (Elicit the response, 'one-half' can be represented by a circle with a 'one-half' piece on top.) Great. 'One-half can be represented by a circle with a 'one-half' piece on top. Thanks for helping me out."

- Think of how to draw the “whole” piece and draw it – “Now, how can I draw the ‘whole’? (Elicit the response, “you can draw it by drawing a circle.”) Excellent thinking. I can represent the whole by drawing a circle. I’ll do that now.”
- Think of how to draw the “part” – “How can I draw the ‘part’ or ‘one-half’? Oh yea, I can draw a line first that separates the whole circle into two equal parts.”
 - Draw the line(s) that represent the fractional part. – “Now I have two equal parts, but what I need to represent is one of the two equal parts, or ‘one-half’. How can I do that? (Elicit the response, “you can shade in one of the parts.”) That’s correct. Why does shading in one of the two equal parts represent ‘one-half’? (Elicit the response, “because the ‘one-half’ piece is a darker color and it is one of two equal parts of a whole circle.”)”
 - Shade in the appropriate “part” that represents the fractional part.
- Teacher asks questions/Teacher answers questions about the drawing and its relationship to the concrete material and the fractional part.
 - “Do I have my whole represented? (Elicit the response, “Yes, you drew a circle that represents the whole circle when we use circle pieces.”) That’s right, the circle I drew represents a ‘whole’ circle piece.”
 - “Do I have the part represented? (Elicit the response, “Yes, you drew a line to separate the whole circle into two equal parts and then you shaded in one part.”) Great! I drew a line first that cut the whole circle into two equal parts and then I shaded one of the parts.”
 - Does my drawing represent ‘one-half’? – “Yes, I have a whole circle cut into two equal parts and one part is shaded. The part that is shaded represents ‘one-half’ of the whole circle.”

b. *Maintain medium level of teacher direction/support for another example if students demonstrate misunderstanding/non-understanding; move to a low level of teacher direction/support if students respond appropriately to the selected questions/prompts.*

3.) Scaffold Using a Low Level of Teacher Direction/Support

a. When students demonstrate increased competence, do not model the process. Ask students questions and encourage them to provide all the responses. Direct students to replicate the process at their desks as you work together.

For Example:

- Remind students of the pizza or dog leash story situation used from Explicit Teacher Modeling at the concrete level. (e.g. What is the story we are acting out?)
- Model deciding which “type” of drawing you will use (e.g. circles, rectangles/bars, etc.) and relate your choice to actual concrete materials. Also relate why you chose this type of drawing.

- "Alright, you've helped me draw fractional parts several times. You are going to draw one with me this time. What kind of drawing should we use for this fractional part? (Elicit responses and choose one to do.) Why might this be a good one to use? (Elicit several student ideas). Great reasons. Let's get started."

- Think of what the concrete material looks like – "Hmm, what does 'one-half' look like with circle pieces? (Elicit the response, 'one-half' can be represented by a circle with a 'one-half' piece on top.) Great. 'One-half can be represented by a circle with a 'one-half' piece on top. Thanks for helping me out."
- Think of how to draw the "whole" piece and draw it – "Now, how can we draw the 'whole'? (Elicit the response, "we can draw it by drawing a circle.") Excellent thinking. We can represent the whole by drawing a circle. Let's all do that now."
- Think of how to draw the "part" – "How can we draw the 'part' or 'one-half'? (Elicit the response, "we can draw a line first that separates the whole circle into two equal parts.") That's right. Let's all do that now."
 - Draw the line(s) that represent the fractional part. – "Now we have two equal parts, but what is it that we need to represent? (Elicit the response, "one of the two equal parts, or 'one-half'.") Yes. How can we do that? (Elicit the response, "we can shade in one of the parts.") That's correct. Why does shading in one of the two equal parts represent 'one-half'? (Elicit the response, "because the 'one-half' piece is a darker color and it is one of two equal parts of a whole circle.") Wonderful thinking. Let's all shade in one of the parts."
 - Shade in the appropriate "part" that represents the fractional part.
- Teacher asks questions/Teacher answers questions about the drawing and its relationship to the concrete material and the fractional part.
 - "Do we have the whole represented? (Elicit the response, "Yes, we drew a circle that represents the whole circle when we use circle pieces.") That's right, the circle we drew represents a 'whole' circle piece."
 - "Do we have the part represented? (Elicit the response, "Yes, we drew a line to separate the whole circle into two equal parts and then we shaded in one part.") Great! We drew a line first that cut the whole circle into two equal parts and then we shaded one of the parts."
 - "Does our drawing represent 'one-half'? (Elicit the response, "Yes, I have a whole circle cut into two equal parts and one part is shaded. The part that is shaded represents 'one-half' of the whole circle.") I think you've got it. Excellent job guys!"

b. When you are confident students understand, ask individual students to direct the problem solving process or have the class direct you: Students ask the questions and you and the students respond/perform the skill.

Instructional Phase 2: Facilitate Acquisition to Mastery

*Practice should be provided for drawing each of the fractional parts taught during Phase 1- "Initial Acquisition" and for writing the fraction using numbers and symbols. A separate practice lesson should be provided for each of these skills. This teaching plan provides a detailed description of two practice activities, one at the receptive or recognition level of understanding and one at the expressive level of understanding. The receptive/recognition level of understanding requires students to "recognize" the correct response from a given set of possible responses. This is an easier task than expressing what you know from memory recall. The expressive level of understanding requires students to actually perform the skill when given an appropriate prompt. This level of understanding is more difficult and demonstrates a more advanced level of understanding. For students with learning problems, it is important to remember that their learning occurs most efficiently in increments of understanding. Developing success and understanding at the receptive/recognition level provides them a sound foundation for success at the expressive level.

1. Receptive/Recognition Level

Purpose: to provide students many practice opportunities to draw fractional parts in a way that is motivating to them.

Self-correcting Material/Instructional Game

Materials:

Teacher -

- decks of cards that have a prompt on one side and the correct response on the other side. For practice with recognizing drawings of fractional parts, one side has a phrase that describes a fractional part (e.g. "one-fourth," "one of eight equal parts") along with three different pictures, one of which accurately represents the fractional part. On the other side is the picture of the appropriate response. For practice writing fractions, one side of each card has a phrase or picture that describes a fractional part, along with three different written fractions. On the other side is the appropriate written fraction.

Students -

- deck of cards (see above)
- a scoring sheet labeled with two columns. One column is labeled "Correct" and one column is labeled "I need help" (this could be pre-made or students can use their own paper).
- pencils for writing.

Description:

Activity: Students can work individually or in pairs. Students pick card from deck. They choose which of the pictures on the front of the card “matches” the fraction phrase. The card is turned over to reveal the correct picture. Student keeps track of number of correct responses and number of “I need help” responses on a piece of paper labeled “Correct”/“I need Help.” Students working in pairs can play a board game where they roll dice or spin a spinner. They pull a card from the deck and respond. If they are correct, then they move the number of spaces indicated by the die or the spinner. Each students keeps track of number of correct responses and number of “I need help” responses on a piece of paper labeled “Correct”/“I need Help” for the classmate they are playing with. *Teacher can ask students to put the cards they respond to into two piles (those they get correct and those they need help on). The teacher can then review them to see what fractional parts and what type fraction model pictures students are having difficulty with.

Self-correcting Materials/Instructional Games Steps:

- 1.) Introduce self-correction material/game.
- 2.) Distribute materials.
- 3.) Provide directions for self-correcting material/game, what you will do, what students will do, and reinforce any behavioral expectations for the activity.
- 4.) Provide time for students to ask questions.
- 5.) Model responding/performing skill within context of the self-correcting material/game.
- 6.) Model how students can keep track of their responses.
- 7.) Have students practice one time so they can apply what you have modeled. Provide specific feedback/answer any additional questions as needed.
- 8.) Monitor students as they work
- 9.) Provide ample amounts of positive reinforcement as students play.
- 10.) Provide specific corrective feedback/ re-model skill as needed.
- 11.) Encourage students to review their individual response sheets, write the total number of “correct” responses under the “C” column and do the same for the “H” column.
- 13.) Review individual student performance record sheets.

2. Expressive Level

Purpose: to provide students many opportunities to draw fractional parts or write fractions and to describe what their drawings mean and what the numbers and symbols of their written fractions mean.

A. Structured Language Experiences/Structured Peer Tutoring

Materials:

Teacher -

- sets of cards. The front side has a fraction phrase on it. The opposite side has the appropriate drawing or written fraction.

- language guide. A brief guide for the student playing the role “listener/evaluator.” On it are the drawings and/or written fraction students are practicing with the appropriate language/graphic that describes it. For example numbered to cue that the “talker/describer” needs to refer to two equal parts adscribes them (e.g. for a circle drawing of ‘one-half,’ a picture of ‘one-half’ would have each part numbered and the shaded part circled, cueing the “listener/evaluator” what features the “talker/describer” needs to refer to; for the written fraction ‘one-half,’ the number ‘1,’ the ‘/’ symbol, and the number ‘2’ would have written beside then what each stands for.). One guide can be constructed and then the appropriate copies made.

Students –

- each pair has a set of cards (see above)
- sheet of paper to write responses
- language guide (see above)
- paper and pencils

Description:

Activity: Students work in pairs. One student plays the “talker or describer” and one student plays the “listener or evaluator.” Students switch roles half-way through the time period. Each student pair has a set of flash cards. On one side of the flash card is a fraction phrase (e.g. “one-fourth,” “one of two equal parts”). On the other side is the appropriate picture or written fraction. Cards are put in a pile “face-up” (with the fraction phrase exposed). Each student either draws the fractional part or writes the appropriate fraction based on the fraction phrase. When both students finish drawing or writing, students turn the card over to check their responses. Then, the “talker/describer” describes why their response represents the fractional part (e.g. for drawing – “I have four circle parts. One of my parts is shaded. That means the same thing as one-fourth/one of four equal parts; for writing fractions – “my ‘1’ means one part, the ‘/’ means ‘of’, and the four means ‘four equal parts.’ My fraction means one of four equal parts, or one-fourth.). The “listener/evaluator” checks the “language guide” and provides appropriate feedback based on the “talker’s/describer’s” response. The “listener/evaluator” then records whether their partner’s response was correct or incorrect. Teacher circulates the room monitoring student academic and social behaviors. Teacher provides positive reinforcement, specific corrective feedback, and answers questions as needed.

Structured Language Experiences/ Structured Peer Tutoring Steps:

- 1.) Select pair groups and assign each pair a place to practice (try to match students of varying achievement levels if possible).
- 2.) Review directions for completing structured language experiences/peer tutoring activity and relevant classroom rules. Practice specific peer tutoring procedures as needed (see step #4).
- 3.) Model how to perform the skill(s) within the context of the activity *before* students begin the activity. Model both how to draw or write the fraction and model how to describe the drawing or written fraction.

- 4.) Divide the practice period into two equal segments of time. One student in each pair will be the "talker/describer" and will describe their drawing or written fraction. The other "player" will be the "listener/evaluator" and will give the "player" based on their description of their drawing or written fraction using the language guide. The "listener/describer" will also provide positive reinforcement, corrective feedback, and tally corrects and incorrects based on the player's responses.
- 9.) Provide time for student questions.
- 10.) Signal students to begin.
- 11.) Signal students when it is time to switch roles.
- 12.) Monitor students as they work in pairs. Provide positive reinforcement for both "trying hard," responding appropriately, and for students using appropriate tutoring behaviors. Also provide corrective feedback and modeling as needed.
- 13.) Teacher reviews student response sheets to check for understanding.

Instructional Phase 3: Evaluation of Student Learning/Performance (Initial Acquisition through Mastery/Maintenance)

Continuously Monitor & Chart Student Performance

Purpose: to provide you with continuous data for evaluating student learning and whether your instruction is effective. It also provides students a visual way to "see" their learning.

Materials:

Teacher -

- appropriate prompts if they will be oral prompts
- appropriate visual cues when prompting orally
- timer (for writing fractions)

Student -

- appropriate response sheet/curriculum slice/probe
- graph/chart

Description:

You should evaluate both the students' abilities to draw fractional parts and to write fractional parts. The following steps outline a process for doing this for both skills. It is suggested that you evaluate students' ability to draw fractional parts first since this is what you will be teaching first and providing student practice for first. When students show mastery drawing fractional parts, then you will teach writing fractions. At this point you will evaluate your students' progress in writing fractions.

Steps for Conducting Continuous Monitoring and Charting of Student Performance:

- 1.) Choose whether students should be evaluated at the receptive/recognition level or the expressive level.
- 2.) Choose an appropriate criteria to indicate mastery.

- *For drawing fractional parts*, an appropriate number of tasks to indicate proficiency is 8 to 10 tasks. This number range allows you to complete the evaluation period within 3 to 5 minutes. *It is important that this evaluation strategy is time-efficient because it should be done every day or every other day and if it is not time-efficient, you will probably not implement this important evaluation strategy.
- *For evaluating writing fractions*, provide at least 20 prompts. Then time students as they respond to the prompts for one minute. Since writing fractions is an “abstract level” task, it is important to use rate/fluency to measure mastery, not only accuracy. Writing fractions efficiently will allow students to be more successful as they work with more advanced math concepts/skills that will involve writing and using fractions.

1.) Provide appropriate number of prompts in an appropriate format so students can respond.

- *for drawing fractional parts*, 8-10 prompts on a curriculum slice/probe that reflect the range of skills you want to evaluate (e.g. one or more fractional parts and using one or more fraction models.) is appropriate.
- *for writing fractions*, provide 20 or more prompts on a curriculum slice/probe that reflect the range of skills you want to evaluate (e.g. one or more fractional parts and using one or more fraction models.) is appropriate.
- Based on the skill, your students' learning characteristics, and your preference, the curriculum slice or probe could be written in nature (e.g. a sheet with appropriate prompts; index cards with appropriate prompts), or oral in nature with visual cues (e.g. say, “show me ‘one-half’ by drawing,” or, “write the fraction that means ‘one-half’” while holding up a card with “one-half” written on it.), or a combination of written curriculum slices/probes and oral prompts with visual cues (e.g. students have a curriculum slice/probe that is numbered “1, 2, 3...” where each number has several fractional parts written – “one-half,” “one-eighth,” “one-fourth,” and students circle the correct response (drawing or writing the appropriate fractional part) when demonstrated by the teacher with a drawing.

4.) Distribute to students the curriculum slice/probe/response sheet.

5.) Give directions.

6.) Conduct evaluation.

7.) Count corrects and incorrects (you and/or students can do this depending on the type of curriculum slice/probe used – see step #3).

8.) You and/or students plot their scores on a suitable graph/chart. A goal line that represents the proficiency (for drawing fractional parts, this should be %100 – 8 out of 8 corrects or 10 out of 10 corrects; for writing fractions, this should be at least 20 with no more than two incorrects) should be visible on each students' graph/chart.

9.) Discuss with children their progress as it relates to the goal line and their previous performance. Prompt them to self-evaluate.

10.) Evaluate whether student(s) is ready to move to the next level of understanding or has mastered the skill at the abstract level using the following guide:

Representational Level: demonstrates %100 accuracy drawing fractional parts (given 8-10 response tasks) over two to three consecutive days.

Abstract Level: demonstrates near %100 accuracy for writing fractions given drawings and language that describes fractional parts (two or fewer incorrects) and a rate (# of corrects per minute) that will allow them to be successful when using that skill to solve real-life problems and when using the skill for higher level mathematics that require use of that skill.

11.) Determine whether you need to alter or modify your instruction based on student performance.

2. Additional Assessment Activity Appropriate For This Math Skill/Concept

Purpose: to evaluate student conceptual understanding and provide you information to plan additional instruction.

Flexible Math Interview

Description:

During small group time, the teacher will encourage students to draw fractions and write fractions, then have students describe what they represent. The teacher notes particular misunderstanding/non-understanding for individual students and provides additional modeling based on individual student needs.

Instructional Phase 4: Maintenance

Purpose: to provide students periodic opportunities to respond to previously mastered skills thereby assisting their "maintenance" of the mastered skill. It also provides additional opportunities for students to "re-connect" their abstract understanding to concrete and representational understanding.

1. Center Activities

Description:

During "Center Time" devote one or more centers to the following activities:

Center Idea/Activity #1 - Students use halves, fourths, & eighths pieces to represent their corresponding fractions given on flash cards. Flash cards have pictures that represent the fractional part on the back. Students can self-check by turning the card over and comparing their concrete representation to the picture.

Center Idea/Activity #2 - Students cut fraction pieces from paper copies of figures divided into fractional parts and glue them on learning sheets to represent halves, fourths, etc.

Center Idea/Activity #3 – Students write appropriate fraction given flash cards that have “fraction language” on one side (e.g. “one-half,” “one-fourth,” one part out of eight equal parts,” ect.). Flash cards have the appropriate fraction on the opposite side so students can self-check their responses.

2. Problem of the Day

Description:

Provide a problem of the day that focuses on one or more fractional parts. Orally give the problem while students read the question/prompt written on the chalkboard. Ask students to discuss the strategy they used to get the answer. The student(s) will demonstrate using appropriate manipulatives, by drawing solutions, or by writing the fraction that represents the fractional part given (e.g. “one-half,” “one-fourth,” one part out of eight equal parts,” ect.). Teacher models skill after this discussion, highlighting important ideas/features.