



Instructional Routines for Mathematics Intervention

The purpose of these mathematics instructional routines is to provide educators with materials to use when providing intervention to students who experience difficulty with mathematics. The routines address content included in the grades 2-8 Texas Essential Knowledge and Skills (TEKS). There are 23 modules that include routines and examples – each focused on different mathematical content. Each of the 23 modules include vocabulary cards and problem sets to use during instruction. These materials are intended to be implemented explicitly with the aim of improving mathematics outcomes for students.

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Instructional Routines for Mathematics Intervention

MODULE 7

Concepts of Subtraction



Module 7: Concepts of Subtraction

Mathematics Routines

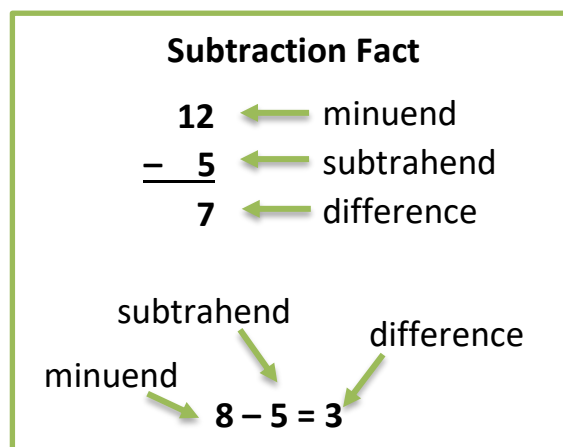
A. Important Vocabulary with Definitions

Term	Definition
compare	To find the difference between two sets.
difference	The result of subtracting one number from another number.
equal sign	The symbol that tells you that two sides of an equation are the same, balanced, or equal.
minuend	The number from which another number is subtracted.
minus sign	The symbol that tells you to subtract.
separate	To start with a set and take away from that set.
subtract/subtraction	To compare two sets or to separate from a set.
subtrahend	The number to be subtracted.

B. Background Information

Students need to learn two concepts of subtraction: (1) subtraction as separating from a set and (2) subtraction as comparison for a difference. Typically, students first learn about subtraction as separating from a set. Then, students learn about comparing two sets for a difference.

For learning the concepts of subtraction, we recommend using *mathematics facts*. We define a subtraction mathematics fact as a single- or double-digit minuend less than 19 and a single-digit subtrahend. The subtrahend is subtracted from the minuend for a difference. You may present subtraction facts vertically or horizontally.



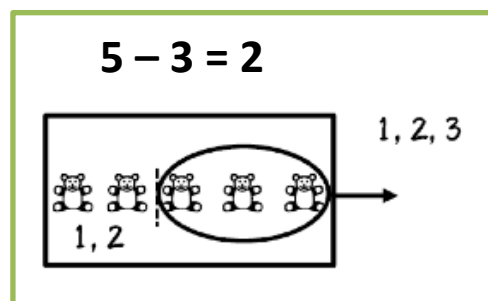
C. Routines and Examples

(1) Subtraction as Separating

Routine

Materials:

- [Module 7 Subtraction Problems](#)
- [Module 7 Vocabulary Cards](#)
 - If necessary, review Vocabulary Cards before teaching
- Any hands-on tool or manipulative (e.g., clips, cubes, dinosaurs)



Teacher Let's work on subtraction. Today, let's think about subtraction as separating. What does it mean to separate?

Students To take some away.

Teacher When we separate, we take some away from a set. For example, you may separate your carrots from your celery. What are some things you separate?

Students I separate the blue candies from all the other candies.

Teacher When you separate, you take some away from a set. Now, let's think about separating numbers. Look at this problem.
(Show problem.)

Teacher First, I notice a minus sign (point). The minus sign tells us to subtract. What does the minus sign mean?

Students To subtract.

Teacher We'll subtract by separating. Let's show the first number with our clips. The first number in a subtraction problem is called the minuend. Say that with me.

Students Minuend.

Teacher In a subtraction problem, we start with the minuend and separate some from the minuend.
(Move clips to workspace.)

Teacher Our minuend is __. What's our minuend?

Students __.

Teacher Let's show this minuend by showing __ clips.
(Show clips.)

Teacher How many clips?

Students __.

Teacher From the minuend we separate the subtrahend. Say that with me.

Students Subtrahend.

Teacher The subtrahend is the number after the minus sign. I remember it by thinking subtract the subtrahend. How could you remember it?

Students Subtract the subtrahend.

Teacher **What's our subtrahend in this problem?**

Students ___.

Teacher **Let's show the subtrahend by separating ___ clips from our minuend. How many clips should we separate or take away?**

Students ___.

Teacher **So, we need to separate ___ clips from ___ clips. What does separate mean?**

Students To take away from a set.

Teacher **Yes. Let's separate, or take away, ___ clips from ___ clips.**
(Separate clips from original set.)

Teacher **To learn the difference, let's count the remaining clips.**
(Count clips.)

Teacher **How many clips remain?**

Students ___.

Teacher **Yes! There are ___ clips. So, ___ minus ___ equals ___. Let's say that together.**

Students ___ minus ___ equals ___.

Teacher **Let's say it together again.**

Students ___ minus ___ equals ___.

Teacher **So, if you have a set of ___ and separate ___, the difference is ___. ___ minus ___ equals ___. Let's review. What's a minuend?**

Students The number from which another is subtracted.

Teacher **What's a subtrahend?**

Students The number to be subtracted.

Teacher **What's a difference?**

Students The amount between the minuend and subtrahend.

Teacher **What does it mean to separate?**

Students To take away.

Teacher **How could you explain separating to a friend?**

Students We started with a set of clips. Then, we separated some clips from that set. The difference is the number of clips remaining after we separated them from the original set.

Example

$$\begin{array}{r} 10 \\ - 6 \\ \hline 4 \end{array}$$

- Teacher** Let's work on subtraction. Today, let's think about subtraction as separating. What does it mean to separate?
- Students To take away from a set.
- Teacher** When we separate, we take some away from a set. Let's think about separating numbers. Look at this problem.
(Show problem.)
- Teacher** First, I notice a minus sign (point). The minus sign tells us to subtract. What does the minus sign mean?
- Students To subtract.
- Teacher** We'll subtract by separating. Let's show the minuend with our dinosaurs. What's the minuend?
- Students The number you start with in a subtraction problem.
- Teacher** Our minuend is 10. What's our minuend?
- Students 10.
- Teacher** Let's show the minuend by showing 10 dinosaurs.
(Show 10 dinosaurs.)
- Teacher** How many dinosaurs?
- Students 10.
- Teacher** Now, let's focus on the subtrahend. What's the subtrahend?
- Students The number you separate from the minuend.
- Teacher** And the subtrahend comes after which symbol?
- Students The minus sign.
- Teacher** That's right. The subtrahend comes after the minus sign. We subtract the subtrahend. What's our subtrahend?
- Students 6.
- Teacher** Let's separate or take away 6 dinosaurs from the 10.
(Take away 6 dinosaurs. Move to side.)
- Teacher** How many dinosaurs do we have now? Let's count!
- Students 1, 2, 3, 4.
- Teacher** So, we subtracted 10 minus 6. We subtracted by separating the 6 dinosaurs from the 10 dinosaurs. What's the difference between 10 and 6?
- Students 4.
- Teacher** Yes! There are 4 dinosaurs remaining. So, 10 minus 6 equals 4. Let's say that together.
- Students 10 minus 6 equals 4.
- Teacher** Let's say it together again.
- Students 10 minus 6 equals 4.

Teacher So, if you have a set of 10 and separate, or take away, 6 from the set, the difference is 4. 10 minus 6 equals 4. Let's review. What's a minuend?

Students The number from which another is subtracted.

Teacher What's a subtrahend?

Students The number to be subtracted.

Teacher What's a difference?

Students The amount or space between the minuend and subtrahend.

Teacher What does it mean to separate?

Students To take away.

Teacher How could you explain separating to a friend?

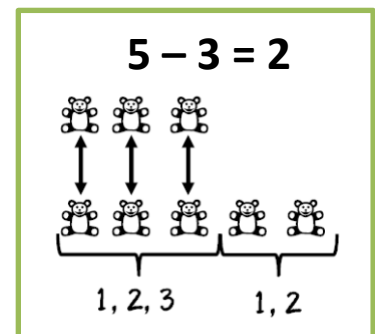
Students We started with a set of dinosaurs. Then, we separated some dinosaurs from that set. The difference was the number of dinosaurs remaining after we separated them from the original set.

(2) Subtraction as Comparing

Routine

Materials:

- [Module 7 Problems](#)
- [Module 7 Vocabulary Cards](#)
 - If necessary, review Vocabulary Cards before teaching
- Any hands-on tool or manipulative (e.g., clips, candies, cubes)



Teacher Let's work on subtraction. Today, let's think about subtraction as comparing. What does it mean to compare?

Students To find the difference between two sets.

Teacher When we compare, we find the differences between two sets. For example, you and your friend might compare your heights to see who is taller or shorter. What's another way you might compare?

Students I might compare who has more Legos; I could compare how much longer my jump rope is than my sister's jump rope.

Teacher When you compare, you find the difference between two sets. Now, let's think about comparing in subtraction. Look at this problem.
(Show problem.)

Teacher First, I see a minus sign (point). The minus sign tells us to subtract. What does the minus sign mean?

Students To subtract.

Teacher Today we'll subtracting by comparing, but there are other ways to subtract. Let's start by showing the minuend with our candies and then comparing those candies to another set to find the difference. Let's do this together.

(Move candies to workspace.)

Teacher Our minuend is __. What's our minuend?

Students __.

Teacher Let's show this minuend by showing __ candies.

(Show candies in a line.)

Teacher How many candies?

Students __.

Teacher Our subtrahend is __. What's our subtrahend?

Students __.

Teacher Let's show the subtrahend by showing __ candies. I'm going to use different colored candies for the difference.

Teacher How many candies?

Students __.

Teacher Now, let's compare the first set of candies – the minuend – to the second set of candies – the subtrahend. What does comparing mean?

Students To find the difference between two sets.

Teacher Yes. Let's compare the sets of candies. I can count the difference as: __, __, __, ... What's the difference between the two sets of candies?

Students __.

Teacher The difference is __ candies. So, __ minus __ equals __. Let's say that together.

Students __ minus __ equals __.

Teacher Let's say it together again.

Students __ minus __ equals __.

Teacher So, if you have a set of __ and compare __ to the set, the difference between the two sets is __. __ minus __ equals __. Let's review. What's a minuend?

Students The number from which another is subtracted.

Teacher What's a subtrahend?

Students The number to be subtracted.

Teacher What's a difference?

Students The amount or space between the minuend and subtrahend.

Teacher What does it mean to separate?

Students To take away.

Teacher How could you explain separating to a friend?

Students We started with a set of candies. Then, we compared that set of candies to another set of candies. We counted the difference between the two sets.

Example

$$\begin{array}{r} 10 \\ - 6 \\ \hline 4 \end{array}$$

- Teacher** Let's work on subtraction. Today, let's think about subtracting as comparing. What does it mean to compare?
- Students** To find the difference between two sets.
- Teacher** When we compare, we look at two sets to determine the difference. Now, let's think about comparing in subtraction. Look at this problem.
(Show problem.)
- Teacher** First, I see a minus sign (point). The minus sign tells us to subtract. What does the minus sign mean?
- Students** To subtract.
- Teacher** Today we'll subtract by comparing, but there are other ways to subtract. Let's start by showing the minuend with our cubes and then comparing the subtrahend with cubes to find the difference. Let's do this together.
(Move cubes to workspace.)
- Teacher** Our minuend is 10. What's our minuend?
- Students** 10.
- Teacher** Let's show this minuend by showing 10 red cubes.
(Show 10 red cubes.)
- Teacher** How many red cubes?
- Students** 10.
- Teacher** Our subtrahend is 6. What's our subtrahend?
- Students** 6.
- Teacher** Let's show the subtrahend by showing 6 yellow cubes.
(Show 6 yellow cubes. Line up under the 10 red cubes.)
- Teacher** How many yellow cubes?
- Students** 6.
- Teacher** Now, let's compare the two sets of cubes. What does comparing mean?
- Students** To find the difference between two sets.
- Teacher** Yes. Let's compare the 10 red cubes to the 6 yellow cubes. We have 1, 2, 3, 4 more red cubes. How many more red cubes?
- Students** 4.
- Teacher** To compare, we count the difference between the two sets. The difference between 10 and 6 is 4. What's the difference?
- Students** 4.
- Teacher** Yes! The difference is 4. So, 10 minus 6 equals 4. Let's say that together.
- Students** 10 minus 6 equals 4.
- Teacher** Let's say it together again.
- Students** 10 minus 6 equals 4.

- Teacher** So, if you compare 10 to 6, the difference is 4. 10 minus 6 equals 4. Let's review.
What's a minuend?
- Students** The number from which another is subtracted.
- Teacher** **What's a subtrahend?**
- Students** The number to be subtracted.
- Teacher** **What's a difference?**
- Students** The amount or space between the minuend and subtrahend.
- Teacher** **What does it mean to separate?**
- Students** To take away.
- Teacher** **How could you explain separating to a friend?**
- Students** We showed 10 red cubes and 6 yellow cubes. We compared the difference between 10 and 6. The difference was 4.
-

D. Problems for Use During Instruction

[See Module 7 Problem Sets.](#)

E. Vocabulary Cards for Use During Instruction

[See Module 7 Vocabulary Cards.](#)

F. Supplementary

COUNTING UP

Subtraction

1. Put the subtrahend in your fist and say it.
2. Count up your fingers to the minuend.
3. The difference is the number of fingers you have up.

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Module 7:

Concepts of Subtraction

Problem Sets

- A. Single- and double-digit subtraction facts (60)

$$\begin{array}{r} 8 \\ - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ - 5 \\ \hline \end{array}$$

5

1

-

$$\begin{array}{r} 7 \\ - 3 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ 3 \\ \hline - \end{array}$$

$$\begin{array}{r} 4 \\ - 2 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ - 1 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ - 3 \\ \hline \end{array}$$

9

4

-

$$\begin{array}{r} 6 \\ - 4 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ - 2 \\ \hline \end{array}$$

3
0
-

8

4

-

2
1
-

$$\begin{array}{r} 4 \\ - 3 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ - 1 \\ \hline \end{array}$$

5
0
-

$$\begin{array}{r} 4 \\ - 1 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ 3 \\ \hline - \end{array}$$

$$\begin{array}{r} 9 \\ - 6 \\ \hline \end{array}$$

- 8
9

4
0
-

$$\begin{array}{r} 6 \\ - 2 \\ \hline \end{array}$$

10

-

3



12

-

4

17

- 9

12

- 6

15

-

8

13

-

7

14

-

8

16

-

8

11

-

3



13

-

5



10

-

6

13

-

6

18

-

3



16

-

9



15

- 5

14

-

2

13

-

8

10

-

7

11
- 7

11

-

6

12

-

8

13

-

3



11

-

1

15

-

2

16

-

7

0

0

-

1

1

-

$$\begin{array}{r} 2 \\ - 2 \\ \hline \end{array}$$

$$\begin{array}{r} \text{—} \\ \text{—} \end{array} \quad \begin{array}{r} 3 \\ 3 \end{array}$$

4

4

-

$$\begin{array}{r} 5 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ - 6 \\ \hline \end{array}$$

7

7

-

$$\begin{array}{r} 8 \\ 8 \\ - \\ \hline \end{array}$$

-
 9
 9

Module 7: Concepts of Subtraction

Vocabulary Cards

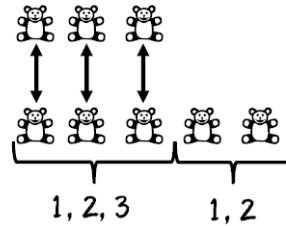
compare
difference
equal sign
minuend
minus sign
separate

subtract/subtraction
subtrahend

compare

To find the difference between two sets.

$$5 - 3 = 2$$



difference

The result of subtracting one number from another number.

$$6 - 4 = 2$$

2 is the **difference**

equal sign

The symbol that tells you that two sides of an equation are the same, balanced, or equal.

$$12 - 8 = 4$$

= is the **equal sign**

minuend

The number from which another number is subtracted.

$$9 - 4 = 5$$

9 is the **minuend**

minus sign

The symbol that tells you to subtract.

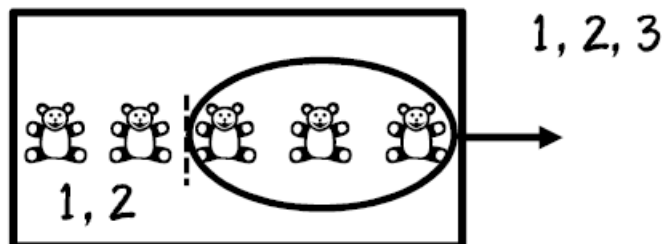
$$9 - 4 = 5$$

- is the **minus sign**

separate

To start with a set and take away from that set.

$$5 - 3 = 2$$

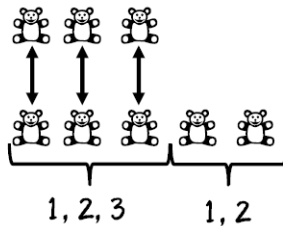


subtract/subtraction

To compare two sets or to take away from a set.

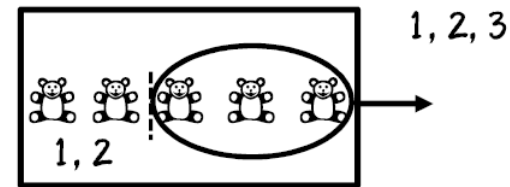
To compare two sets

$$5 - 3 = 2$$



To take away from a set

$$5 - 3 = 2$$



subtrahend

The number to be subtracted.

$$9 - 4 = 5$$

4 is the **subtrahend**