
“...mathematics must also be taught in the form of questions and answers”
‘Abdu’l-Bahá¹

NUMERACY FOR THE JUNIOR YOUTH ADDITION AND SUBTRACTION

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These Numeracy learning materials were initially developed for use in rural schools affiliated with the Foundation for the Advancement of Science, Lucknow, India. The activities focus on addition and subtraction and are also relevant to the spiritual needs of the Junior Youth age range. Reflections and quotations from the Bahá’í Writings are included.

The purpose of this unit is to assist students in developing mental arithmetic skills through place value. The emphasis is on adding and subtracting up to two digits. The learning activities place special in conceptual understanding of ten as the base unit for computation thus reinforcing place value understanding. It is advisable that procedural arithmetic takes place after conceptual understanding through these reflective activities is attempted.

The content is developed in five lessons as indicated below. Activities are easy to follow requiring little teaching assistance. It is important, however, that at the end of each lesson a class discussion is carried out to consolidate content knowledge. The activities make use objects that can easily found in rural environments such as beads, cards and dices. Applications of these tasks to spiritual principles are included to enrich the spiritual dimensions of learning.

Content:

Lesson 1: Adding in units and tens

Lesson 2: Subtracting in units and tens

Lesson 3: Counting in 5s and 10s

Lesson 4: Adding two-digit numbers

Lesson 5: Subtracting two-digit numbers

¹ Talks of ‘Abdu’l-Bahá: The Bahá’í World, Vol. IX, p. 543; Bahá’í Education, p. 73.

LESSON 1: ADDING IN UNITS AND TENS

Aim of the lesson: Students develop the ability of mentally adding numbers in tens.

Concept: We tend to count and add in tens because we have ten fingers that help us with calculation wherever we are.

Skill: Students develop the skills of counting and adding in tens initially using fingers but later through word problems, number lines, games and symbolic representation.

Quality/Attitudes: Recognize that God has created our bodies in a way we can use it for learning and working. Explain that part of our body has been created by God for a purpose. Having ten fingers have made mankind to develop number systems based on tens.

Activity 1: *Show me your fingers*

Purpose: Students relate addition and subtraction as reciprocal operation in adding two numbers to 10.

Instructions:

The teacher questions a student with the following prompts:

- (1) "Show me 4 fingers"
- (2) "How many more fingers to make 10?"
- (3) "What makes 10?"
- (4) "10 take 4 is ..."
- (5) "10 take 6 is..."

Repeat the same process with 3, 6 and 8 fingers.

Activity 2: *Ten-frames*

Purpose: To count having 5 and 10 as a base.

Instructions: Ask students how many dots are needed to fill ten-box frames as shown below. Copy the frames on the board for class discussion. Create your own frames.

●	●			

●	●	●	●	●

●	●	●	●	●
●	●			

Activity 3: Tell me a story

Purpose: Students create their own stories representing adding two digits to 10.

Instructions:

- Model the activity with the following example: “I have 3 goats in my farm. How many more goats do I need to have 10?”
- Ask students to come up with their own stories.

Activity 4: The Make 10 grid

Purpose: Students add simple digits to 10.

Instructions:

- Copy the following grids on the blackboard and ask students to identify two digits that add to 10.

6	2	9	4	8
1	2	7	5	3
3	5	4	9	3
7	9	8	7	5
1	6	9	1	5

8	7	6	4	3
1	4	5	9	7
7	9	2	6	3
4	8	2	5	6
0	1	10	3	5

- Ask students to design their own grids and share them with their classmates.

Activity 5: Make 10

Purpose: Students add simple digits to 10.

Instructions:

- Copy the grid below on the board.

5	4	1	2	3
5	5	1	4	8
4	3	7	2	6
2	3	1	9	7
8	0	10	3	9

- Ask students to highlight two consecutive numbers that together add to 10. Students can go vertically, horizontally or diagonally.
- Ask students to design their own grids and share them with their classmates.

Activity 6: Find the missing number

Purpose: Students mentally find digits adding to 10 through word problems.

Instructions:

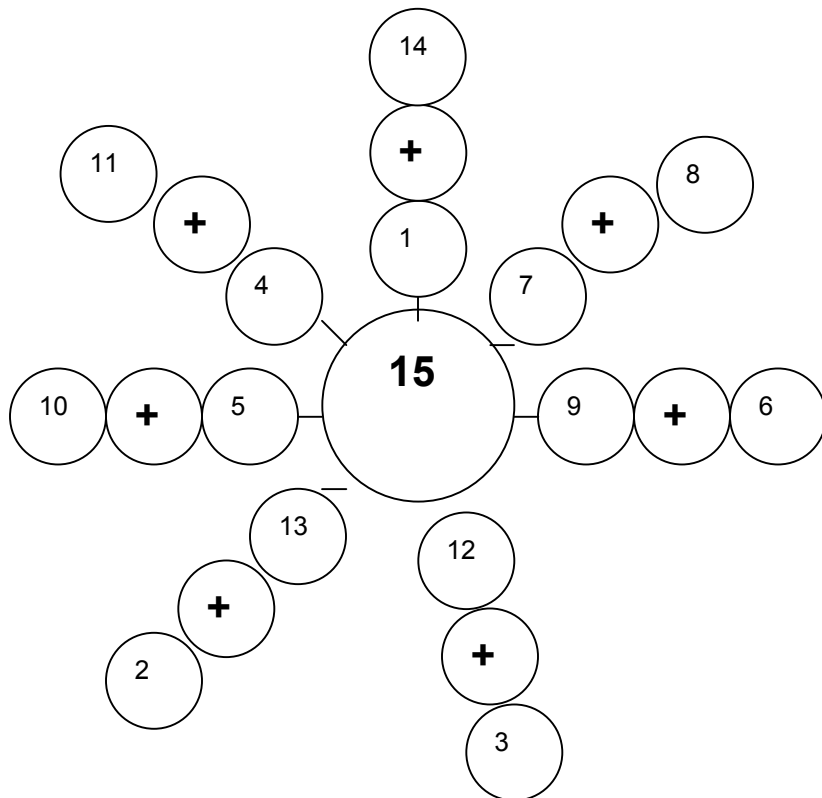
- Teachers ask questions such as:
 - “Which number added to 3 gives you 10?”
 - “How do you get 10 buffalos if you only have 8?”
 - “How many more years till I turn 10?”
 - “My mother gave me 4 rupees. How much should I save to buy a pencil worth 10 rupees?”
- Ask students to create their own word problems.

Activity 7: The Addition Wheel

Purpose: Students recall addition facts to twenty.

Instructions: Draw an addition wheel diagram on the board and ask students to fill it in. In the addition wheel students are to find two numbers which will add to a number between 11 and 20.

In the example below, the total number in the centre is 15.



Purpose: Students solve simple equations adding to 10.

Instructions: Ask students to solve the missing numbers on the statements. Copy these simple equations on the board first.

$3 + ? = 10$

$2 + ? = 10$

$4 + ? = 10$

$4 + ? = 10$

$7 + ? = 10$

$5 + ? = 10$

$? + 1 = 10$

$? + 4 = 10$

$? + 6 = 10$

$6 + ? = 10$

$? + 3 = 10$

$? + 0 = 10$

$? + 5 = 10$

$? + 7 = 10$

$? + 2 = 10$

$? + 9 = 10$

$8 + ? = 10$

$9 + ? = 10$

Memorize the following quotation after explaining it:

"The body is the horse, the soul is the rider" 'Abdu'l-Bahá

Lesson 2: Subtracting in Units and Tens

Aim of the lesson: Students develop the ability of mentally subtracting numbers in tens.

Concept: We tend to count, add and subtract in tens because we have ten fingers that help us with calculation wherever we are.

Skill: Students may subtract initially using fingers but later they use word problems, number lines, games and symbolic representation.

Quality/Attitudes: To understand the need to look after one another

Activity 1: *Jump on the line*

Purpose: Counting backwards from 10.

Instructions:

- Using a piece of chalk draw a number line on the floor



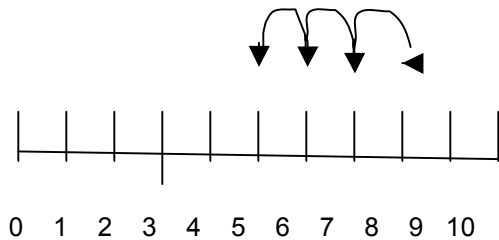
- Starting from 10 ask students to jump on the line to represent sums like $10 - 7$, $10 - 5$, etc

Activity 2: *Jumping from 10*

Purpose: Counting backward from 10

Instructions:

- Draw a number line on the board and write “10 – 3”. Explain that to perform that sum you start jumping backward from 10 three times to finally reach 7.



- Ask students to represent the following sums on the same number line:

$10 - 2 =$	$10 - 7 =$
$10 - 4 =$	$10 - 8 =$
$10 - 5 =$	$10 - 9 =$
$10 - 6 =$	$10 - 10 =$

Activity 3: *Tell me a story*

Purpose: Students connect subtraction to real life situations

Instructions:

- Write a sum in terms of tens such as “ $10 - 2 = 8$ ” on the board. Create a story such as: “I had 10 horses and sold 2 therefore I only have 8”
- Invite students to create stories around the following sums:

$10 - \underline{\quad} = 8$

$10 - \underline{\quad} = 1$

$10 - \underline{\quad} = 9$

$10 - \underline{\quad} = 0$

$10 - \underline{\quad} = 4$

$10 - \underline{\quad} = 6$

$10 - \underline{\quad} = 3$

$10 - \underline{\quad} = 7$

$10 - \underline{\quad} = 2$

$10 - \underline{\quad} = 5$

Activity 4: *Tossing a dice*

Purpose: Students develop speed in adding and subtracting in terms of 10.

Instructions:

This activity is done in pairs. A student tosses a dice and shows the 1-6 outcome. The other student must say the number that added to the dice outcome will yield 10.

Activity 5: *Ten-frames*

Purpose: To represent sums to 10 on an equation format.

Instructions: Copy the following frames onto the blackboard. Ask students to write a simple statement as to how many dots are needed to fill in the ten-box frames. For example, the statement for the first frame is “ $10 - 2 = 8$ therefore $8 + 2 = 10$.”

●	●			
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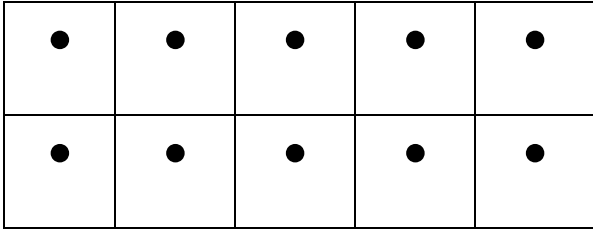
•	•	•	•	•

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Storytelling: *The Rupee Brothers*

Purpose: To understand the need to look after one another

One Rupee, Two-Rupee and Five-Rupee were three brothers living in a Kakori farm. Five Rupee was a five year old coin while Two-Rupee was a two year old coin. One-Rupee was just one year of age. They all wanted one day to become a note rather than being just a coin. Everybody in the Kakori farm wanted to become a Ten-Rupee Note because then they would be allowed to go to high school.



Five-Rupee was the happiest of all. He knew that he would be a high school student sooner than his two brothers. If so, he would be able to ride his own bicycle to town, going early in the morning and coming late in the afternoon. High school students also wear a special uniform and were allowed certain privileges such as having their lunch outside the school.

There was only one sad thought in his mind. Although been a high school student was the dream of his life, Five-Rupee could not bear to be separated from his two brothers. They had grown together and enjoy doing things as a team. “What if the young One-Rupee gets sick?”, he thought. “Mum and Dad are old and very busy working on the land. Two-Rupee is not only my brother but also my best friend and we play together very well”.

Question: Find out how many years will take to Five-Rupee to become a Ten-Rupee Note. How about Two-Rupee and Five-Rupee?

So upset was Five-Rupee that one day he told Two-Rupee and One-Rupee about eventually going to high school and not being able to play together as before. "Do not worry", said Two-Rupee. By the time you are a note, we would have grown and look after ourselves.

Question: How old will One-Rupee and Two-Rupee be when Five-Rupee become a Ten-Rupee Note?

The three Rupee brothers consulted together and gradually understood that eventually everyone will become a Ten-Rupee Note and therefore would leave the village to go to the town school. And so, they would be together playing again all the day.

Question: How old would Five-Rupee be when One-Rupee and Two-Rupee become Ten-Rupee Notes.

Other questions: What spiritual qualities did One, Two and Five-Rupee show to each other?

Lesson 3: Further Addition and Subtraction

Aim of the lesson: To develop students' ability to add and subtract with 5 and 10s in sums over 10.

Concept: Working out sums over 10 could be achieved by decomposing and bridging numbers.

Skill: Students develop further their addition and subtraction skills by mentally relying on units of 5s and 10s.

Attitude/Skills: Cooperation happens when we add strength from one another to complete a task.

Activity 1: Students count beads/seeds in groups of 5s

Purpose: To count in groups of 5s.

Instructions: Ask students to represent seeds in groups of 5s.

$$6 = 5 + 1 \quad \begin{array}{c} \ominus \ominus \ominus \ominus \ominus \ominus = \ominus \ominus \ominus \ominus \ominus \\ \ominus \end{array}$$

$$7 = 5 + 2 \quad \begin{array}{c} \ominus \ominus \ominus \ominus \ominus \ominus \ominus = \ominus \ominus \ominus \ominus \ominus \\ \ominus \ominus \end{array}$$

$$8 = 5 + 3 \quad \begin{array}{c} \ominus \ominus \ominus \ominus \ominus \ominus \ominus \ominus = \ominus \ominus \ominus \ominus \ominus \\ \ominus \ominus \ominus \end{array}$$

$$9 = 5 + 4 \quad \begin{array}{c} \ominus \ominus \ominus \ominus \ominus \ominus \ominus \ominus \ominus = \ominus \ominus \ominus \ominus \ominus \\ \ominus \ominus \ominus \ominus \end{array}$$

Ask students to represent the numbers 10, 12, 15 and 19.

Activity 2: Students count in 5s using beads/seeds

Purpose: To add in groups of 5s

Instructions: Model the following sums by splitting numbers in terms of 5s.

Write on the board and explain the following

$$6 + 9 =$$

$$5 + 1 + 4 + 5 =$$

$$5 + 5 + 1 + 4 =$$

14

$$7 + 9 =$$

$$5 + 2 + 4 + 5 =$$

$$5 + 5 + 2 + 4 =$$

$$10 + 6 =$$

6

Work out the following mentally:

$$8 + 7 =$$

$$5 + 3 + 5 + 2 =$$

$$5 + 5 + 3 + 2 =$$

$$10 + 5 =$$

15

$$5 + 8 =$$

$$5 + 5 + 3 =$$

8

Ask students to mentally perform:

- $8 + 5$
- $9 + 6$
- $5 + 10$
- $9 + 5$
- $6 + 5$
- $6 + 5$
- $6 + 8$
- $7 + 10$

- $6 + 6$
- $7 + 10$
- $5 + 8$
- $7 + 7$
- $5 + 7$
- $10 + 8$
- $9 + 8$

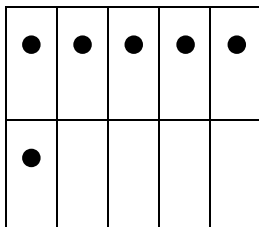
Activity 3: Adding with 5s frames

Purpose: Students add two numbers by splitting numbers

Instructions:

Tell students that you are going to add $6 + 9$.

Draw the following frame on the board and ask them:



Teacher: "How many more to make 10?"

Student: "4"

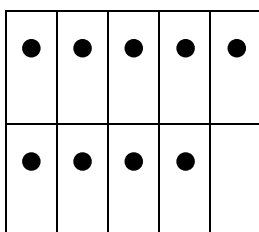
Teacher: "6 and 4 make 10

And 5 more make 15.

Therefore $6 + 9 = 15$ "

Tell students that you are going to add $9 + 8$.

Draw the following frame on the board and ask them:



Teacher: "How many more to make 10?"

Student: "1"

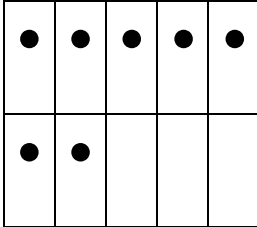
Teacher: "9 and 1 make 10

And 7 more make 17.

Therefore $9 + 8 = 17$ "

Tell students that you are going to add $7 + 8$.

Draw the following frame on the board and ask them:



Teacher: "How many more to make 10?"

Student: "3"

Teacher: "7 and 3 make 10"

And 5 more make 15.

Therefore $7 + 8 = 15$ "

Without visual aids ask students to calculate:

$9 + 5$; $7 + 7$; $5 + 8$; $6 + 8$; $10 + 9$; $8 + 6$; $5 + 8$; $8 + 7$.

Activity 4: *Five-to-Twenty Card Game*

Purpose: *Five-to-Twenty* is a card game played in groups of 2 or 4 people. In this game you have to score as many points as possible counting in 5s and 10s.

Instructions:

Each student is given a suit of cards.

Explain students that the Ace stands for 1, the Jack for 11, the Queen for 12 and the King for 13.

How to score...

Every way you can add up your cards to a total of 5, 10, 15 or 20 wins.

For example, $3 + 2 = 5$, $6 + 3 + 1 = 10$, $9 + 4 + 2 = 15$, $9 + 6 = 15$, Queen (12) + 6 + 2 = 20, King (13) + 7 = 20

Following the “*Five-to-Twenty*” game ask students to write down all the different ways they can make a total of

- 5 (with 2 cards)
- 10 (with 2 and 3 cards)
- 15 (with 2, 3, 4 and 5 cards)
- 20 (with 2, 3, 4 and 5 cards)

Challenge questions: Can you make a total of 20 with 6 cards?

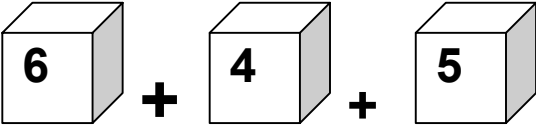
Activity 5: *Five-to-Twenty* with dices

Purpose: Playing *Five-to-Twenty* with three dices involves counting in 5s and 10s.

Instructions:

Ask you students first in how many different ways they can score a total of 15 with three 1-6 dices. You might like to ask students to draw combinations of three cubes adding to 15.

For example:



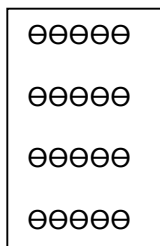
A diagram showing three dice. The first die shows a 6, the second shows a 4, and the third shows a 5. They are arranged horizontally with plus signs between them, followed by an equals sign and the number 10.

$$6 + 4 + 5 = 10$$

Activity 6: Grouping in 10s

Instructions:

Display 28 seeds/bean in groups of 10s: (Draw the seeds/beans on the board)



Ask students:

- How many groups of 10s are there?
- How many more seeds to make 30? Why?
- How many more seed to make 40? Why?

Repeat the same process with 36 seeds.

- How many groups of 10s are there? Why?
- How many more seeds to make 40? Why?
- How many more seed to make 50? Why?
- How many more seed to make 70? Why?

Repeat the same process with 49 seeds.

- How many groups of 10s are there? Why?
- How many more seeds to make 50? Why?
- How many more seed to make 70? Why?
- How many more seed to make 100? Why?

Activity 7: Spot the sum numbers!

Purpose: To find two numbers that add up to 30 and 40

Instructions: Draw the following tables on the board.

Make 30

12	15	13	8	30
19	5	1	18	12
10	16	3	7	11
22	17	27	20	25
0	23	15	14	29

Make 40

10	20	15	8	0
2	25	30	35	3
32	4	5	20	6
34	37	38	6	36
33	40	34	7	9

Storytelling: *Building a Bridge Together*

Kakori and Tamana were two beautiful villages at each side of the river. In dry season they could even cross the river by hopping on the stones and meet together. This was however impossible during the monsoon. When intense rainfall came such encounters were almost impossible. The little river grew so much that water levels could cause a person to be drowned by the strong currents. Local feasts, trade and home visiting had to stop for months.

Their unhappiness gave way to consultations where all families were present including children, women and elderly people. They wanted to know how communication could be maintained despite the flooding.

After discussing a lot about what they are going to do, finally they come up with the idea of building a small bridge.

“A small bridge that would not cost much”, says a mother. “If we all participate voluntarily and bring timber from our farms”, a grandfather added, “then our dreams will come through. “Yes”, a youth said, “we will be like a one body again”. “I can contribute with my truck to carry the materials and build the bridge” a man said.

Having all concluded that money is not a problem because they were all united, the next task was to set up start date. “We need to start in advance before the monsoon season strikes.

Both communities decided that the bridge should be ready by the last day of the May to take advantage of the better weather during construction.

Answer the following questions by looking at the calendar below. (The teacher can copy the calendars on the board.)

- How many days are in March 2008?
- If the meeting took place on the 16TH of March how many days were left up until the end of that month?

MARCH 2008						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Now find out from the calendar the number of days in April.

APRIL 2008						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Without counting first, can you work out how many days were between the 13rd of March and the end of April?

Now, let's see the numbers of days in May. Look at the calendar below for your answer.

MAY 2008						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Let's go back to the answer. We need to find the number of days between 16th of March and the end of May. To do that, you will have to add your three responses together. You might like to check your final answer by counting day by day throughout the three month calendars.

Tell us about the following:

- Why the two villages of Kakori and Tamana were sad?

- How did they reach a solution to their problem?
- What would have happened if there not united?
- What spiritual qualities were used by the village people?
- How would you apply these qualities to situations at home or at your school?

Discuss and memorize the following Bahá'í quotation.

"Oh God! Unite the hearts of Thy people"

Lesson 4: Adding two-digit numbers

Aim of the lesson: Students develop mental strategies to subtract two-digit numbers

Concept: Students add two digit numbers by collecting and decomposing them.

Attitude/quality: Explore the concept of sacrifice as a means to help others.

Activity 1: *Subtracting Adding two-digit numbers by collecting 10s*

Instructions: Tell students that we are going to add $34 + 42$

Arrange two lots of 34 and 43 seeds on a double five-row format.

34		42	
⊖⊖⊖⊖⊖	10 seeds	⊖⊖⊖⊖⊖	10 seeds
⊖⊖⊖⊖⊖		⊖⊖⊖⊖⊖	
⊖⊖⊖⊖⊖	10 seeds	⊖⊖⊖⊖⊖	10 seeds
⊖⊖⊖⊖⊖		⊖⊖⊖⊖⊖	
⊖⊖⊖⊖⊖	10 seeds	⊖⊖⊖⊖⊖	10 seeds
⊖⊖⊖⊖⊖		⊖⊖⊖⊖⊖	
⊖⊖⊖⊖	4 seeds	⊖⊖⊖⊖⊖	10 seeds
		⊖⊖⊖⊖⊖	
		⊖⊖	2 seeds

Ask the class the following questions:

- How many lots of ten seeds/beads are there? (Answer: 7 lots)
- How many extra seeds/beads are there? (Answer: $4 + 2 = 6$)
- How many seeds/beads altogether? 76

Repeat the process for $31 + 43$; $41 + 27$; $24 + 51$ seeds/beads

Extension sums:

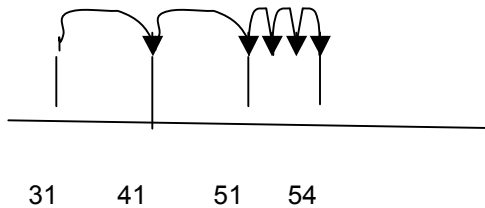
Work out a procedure to add: $16 + 9$; $28 + 27$; $37 + 35$

Activity 2: *Jumping numbers*

Purpose: To add two numbers using the jumping method.

Instructions: Model the sum $31 + 24$ using the jumping method by multiples of ten on the board

Note: Prior to this activity students must be able to use multiples of ten in counting such as : 15, 25, 35, 45,



Practice mentally the following sums: $42 + 34$; $55 + 23$; $12 + 66$; $33 + 33$

Activity 3: *The 1-100 grid*

Purpose: Adding two-digit numbers by using a 1-100 grid.

Instructions: Copy the following 1-100 grid on the board.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Instructions: Decompose $24 + 43$ into $24 + 40 + 3$. Start from 24, move downward 4 squares and then 3 squares to the right. If you move downwards you are counting in tens. If you are moving sideways you are counting in units.

Practice the following sums mentally: $11 + 42$; $34 + 52$, $45 + 31$; $72 + 22$.

Challenge questions: What strategy would you use for $37 + 26$; $26 + 15$; $49 + 33$?

The rice seeds of Lakori were very happy. Following months of growth in the rice fields the time had come for them to be sent to help other farms in the valley. They had had a long and difficult time developing into fully-grown seeds after being exposed to intense sun heat, rain and wind. Through all these harsh conditions they had finally developed into fully-matured seeds that were much needed in the next crop season. As healthy and fresh rice seeds their mission was multiplying themselves into many more rice plants.

'Abdu'l-Bahá says concerning how seeds sacrifice themselves to become useful plants:

“If you plant a seed in the ground, a tree will become manifest from that seed. The seed sacrifices itself to the tree that will come from it. The seed is outwardly lost, destroyed; but the same seed which is sacrificed will be absorbed and embodied in the tree, its blossoms, fruit and branches. If the identity of that seed had not been sacrificed to the tree which became manifest from it, no branches, blossoms or fruits would have been forthcoming”.

Discussion questions:

- How do a seed transform into a big plant or tree.
- What physical differences are between a seed and a tree?
- Can we say that a seed is the essence of a tree?
- Memorize: “The seed sacrifices itself to the tree that will come from it”.

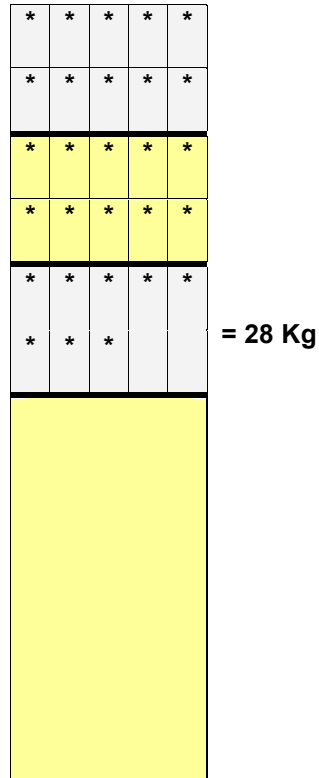
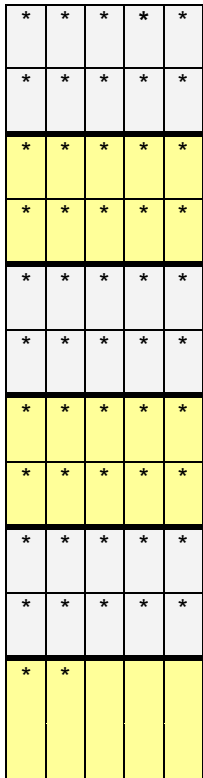
Only one thing made them unhappy. They were told that were going to be packed away in two big bags of 52 and 28 kilograms. It is not that the rice seeds did not want to get separated from each other. They were actually more than happy to sacrifice themselves so that more rice grains can be created. But they did not like the idea of going to two farms only where many seeds would probably be wasted. They rather prefer to be sent to as many farms as possible so that they can be of benefit to more farmers. The seeds decided to do some calculations so that they can be sent in groups of ten kilograms thus reaching out the whole valley.

Before continuing show your class what a kilogram of rice looks like in a small bag.

Let's see how the seeds calculate their weigh in groups of 10s:

Shiba, one of the seeds, decided to see first how much they would weight all together. She said: "Let's add 52 and 28". Shiba then grouped 52 and 28 in groups of ten. The arrangement lookd like this:

1 Kg = *



Questions:

- How many 10s did Shiba find altogether?
- How many extra units did Shiba find?
- How many 10 Kg bags can be made to accommodate all rice seeds?
- Do you have a different method to calculate $52 + 28$? Please show it to the class.

Lesson 5: Subtracting two-digit numbers

Purpose: Students develop mental strategies to subtract two-digit numbers

Concept: Students subtract digit numbers by collecting and decomposing them.

Attitude/quality: The importance of developing friendships.

Activity 1: *Adding two-digit numbers by collecting groups*

Instructions: Tell students that we are going to add $44 + 43$

Arrange two lots of $44 - 32$ seeds on a double five-row format.

44		32	
⊖⊖⊖⊖⊖	10 seeds	⊖⊖⊖⊖⊖	10 seeds
⊖⊖⊖⊖⊖		⊖⊖⊖⊖⊖	
⊖⊖⊖⊖⊖	10 seeds	⊖⊖⊖⊖⊖	10 seeds
⊖⊖⊖⊖⊖		⊖⊖⊖⊖⊖	
⊖⊖⊖⊖⊖	10 seeds	⊖⊖⊖⊖⊖	10 seeds
⊖⊖⊖⊖⊖		⊖⊖⊖⊖⊖	
⊖⊖⊖⊖⊖	10 seeds	⊖⊖	2 seeds
⊖⊖⊖⊖⊖		⊖⊖	
⊖⊖⊖⊖	4 seeds		

Ask the class the following questions;

- How many lots of ten seeds/beads are in 44? (Answer: 4 lots)
- How many lots of ten seeds/beads are in 32? (Answer: 3 lots)
- What is the difference in lots of tens? (Answer: $4 - 3 = 1$)
- What is the difference in extra seeds/beads? (Answer: $4 - 2 = 2$)

Therefore, $44 - 32 = 12$ ($10 + 2$)

Repeat the process for $47 - 32$; $54 - 22$ seeds/beads

Challenge questions:

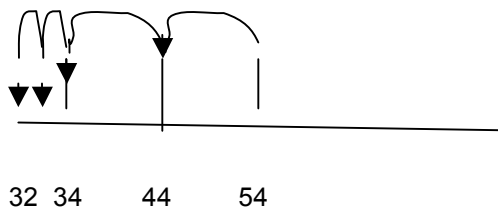
Find a procedure to work out: $36 - 9$; $45 - 28$

Activity 2: *Using the jumping method*

Purpose: Subtracting two-digit numbers by using the jumping method

Instructions: Model the sum $54 - 22$ using the jumping method by multiples of ten on the board

Note: Prior to this activity students must be able to use multiples of ten in counting such as : 54, 44, 34, ...,



Practice mentally the following sums: $42 + 22$; $55 - 23$; $72 - 26$; $93 - 33$

Activity 3: Adding on the 1-100 Grid

Purpose: Adding two-digit numbers by using a 1-100 grid.

Instructions: Copy the following 1-00 grid on the board.

Example: Work out: $56 - 34$

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Instructions: Decompose 34 into $30 + 4$. Start from 56, move upward 2 squares and then 4 squares to the left. If you move upward you are counting in 10s. If you are moving sideways you are counting in units.

Practice the following sums first with the grid and later mentally: $54 - 42$; $84 - 51$, $45 - 31$; $72 - 22$.

Challenge questions: What strategy would you use for $34 - 26$; $23 - 15$; $40 - 33$?

Activity 4: *Missing Numbers*

Purpose: Students count in ones and tens.

Without looking at the 1-100 grid find the missing numbers in the following diagrams.

Discussion questions:

- What happens when you move right?
- What happens when you move left?
- What happens when you move upward?
- What happens when you move downward?

For example, the number in the empty box below is 37.

16	
26	
36	
46	

Now, complete the following exercises by yourself:

1	2	3	4

24	25	26	27

	37
	47
	57
	67

	52
	62
	82

34	35		37

97		99	100

27	28	29	30

	54

64
74

	74	75	76

38	
48	
68	

	23	
32		
52		

	37	
46		

	77	
96		

51		
		63

9		
		31

	38	
47		
	58	

Activity 5: *Using arrows*

Purpose: Students counts in tens and ones.

Instructions: Students using arrows $\leftarrow\uparrow\rightarrow\downarrow$ to represent movements from a starting number from a finishing number on the 100 grid.

\leftarrow take away one

\uparrow count back by ten

\rightarrow add on one

\downarrow count on by ten

For example: The movement from 45 to 21 can be represented by $\downarrow\downarrow\leftarrow\leftarrow\leftarrow$

Activity 6: *The Minus Dice*

Purpose: Students subtract by counting in ones.

Instructions: Students are given an initial score of 100 points. They take turns to roll a dice and subtract the outcome from their own score. The winner is the one who gets zero or less first .

Activity 7: *Literacy activity*

Purpose: To understand various way to express a subtraction statement

Explain students that $8 - 3$ is equivalent to:

- 8 minus 3
- 8 take away 3
- take 3 from 8
- from 8 take 3
- subtract 3 from 8

Ask students to answer to the following oral questions:

- 10 minus 4
- 7 take away 2
- take 5 from 6
- from 9 take 2
- subtract 6 from 10

Activity 7: Word Problems

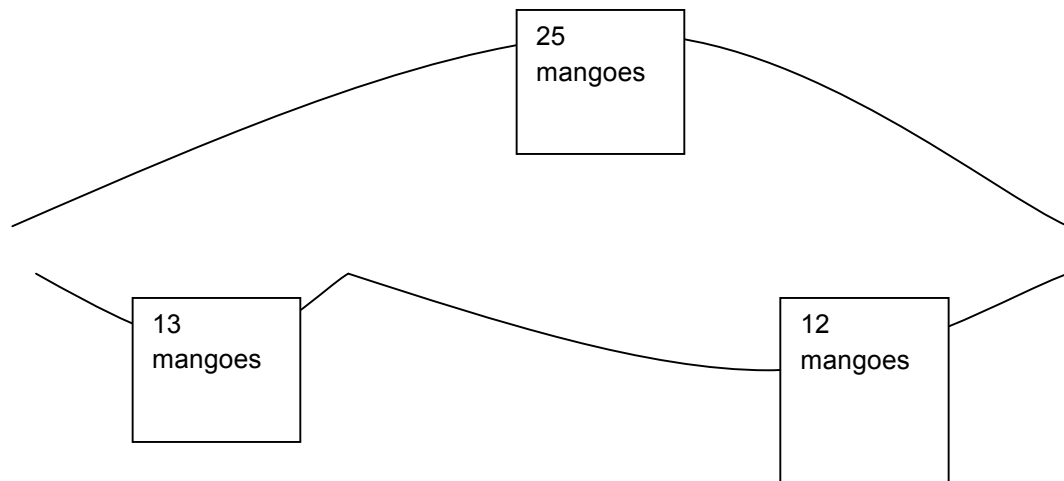
Purpose: To solve word problems using diagrams

Instruction: Sometimes drawing a diagram helps solving a word problem.

Keeran and Keeshan were two close friends who grew up in the same village since they were little children. They went to the same school and usually were together and looking after each other. Keeran and Keeshan did things always together. To go to school Keeran and Keeshan use to ride their bikes through the many mangoes farms spreading along the long road.

One day, on their way back from school, Keeran bought some mangoes. Keeshan bought 12 more mangoes further on the trip and then there were 25 mangoes with both of them. Can you say how many mangoes did Keeran buy at first?

After working out an answer, try to explain the problem using the following diagram. Remember that sometimes is useful to draw a diagram to solve this type of problems.



Now, tell students to draw a diagram by themselves on the following two problems before doing the actual working out.

- Keeran and Keeshan had 28 Rs altogether when they left home. After buying the mangoes, both friends had 17 Rs left. How much did they spend on the mangoes?
- To get to school, Keeran and Keeshan traveled by bicycle for 18 minutes and walked 15 minutes, How long did it take them to get to school

Pose similar problems and ask students to solve them using a diagram

Discussion friends:

Why is important to have a friend?