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Multiplication Tables - W.E. Resource Packs

The Resource Pack are:

- based on the California Framework.
- structured to be “user friendly”.
- approved for legal compliance.
- divided into modules.
- formulated so that sheets can be reproduced for a student to work on.

Sub-Unit 1	Multiplication Tables - Tables 2,3 and 4
Sub-Unit 2	Multiplication Tables - Tables 5,6 and 7
Sub-Unit 3	Multiplication Tables - Tables 8,9 and 10
Sub-Unit 4	Multiplication Tables - Tables 11,12 + Activities

Personal Portfolio

- We recommend that each student creates a personal portfolio.
- In many instances a student will use the reproduced sheets for direct insertion into his/her portfolio.
- The personal portfolio is the main mode of student assessment.
- This personal record provides a comprehensive record of a student’s progress and level of understanding and achievement.

The WEC Approach

We believe that:

- it is more important for students to understand what they are doing than to learn how to solve problems or to compute without such understanding.
- students will gain this understanding if content and methodology relate to their experience of the world.
- the imagination should be stimulated - this can be achieved through a variety of creative and artistic formats.
- since elementary school children live very much in the world of feeling, the process starts in the affective realm, moves to action and the world of concrete experience, and only then to abstract concept.
- storytelling should be used extensively to stimulate the imagination, and to relate to the students' inner life and experience.
- effective teaching should relate to both the right and left hand brain - to encourage both intuitive and global as well as analytical and linear thinking.

Rhythmic Action

- Younger elementary school children generally respond immediately and spontaneously to rhythm.
- The popularity of the playground swings, the jump rope games, the skipping games, and the ball games with accompanying rhymes, all reflect rhythm within children, and their desire to involve themselves in rhythmic activity.
- It is a very natural step therefore to use rhythm in the early teaching of multiplication - this may be done in a number of ways.
- Rhythmic counting generally finds an enthusiastic response with young children. For example rhythmic counting may accentuate every fourth number - for instance the numbers 4, 8, 12 etc. are spoken louder than the rest.
- This is also effective when accompanied by movement such as clapping or striding. For example, a group counting from 1 to 36 would clap their hands when saying 3, 6, 9 etc.: or make a stride forward on these numbers.
- If the numbers between are gradually spoken softly then eventually the children will just be calling out the multiples of 3 or the multiples of 4 etc.
- Chanting the tables also has a place. This is even more effective if the chanting is accompanied by some kind of physical movement such as marching or clapping.

Teachers' Note

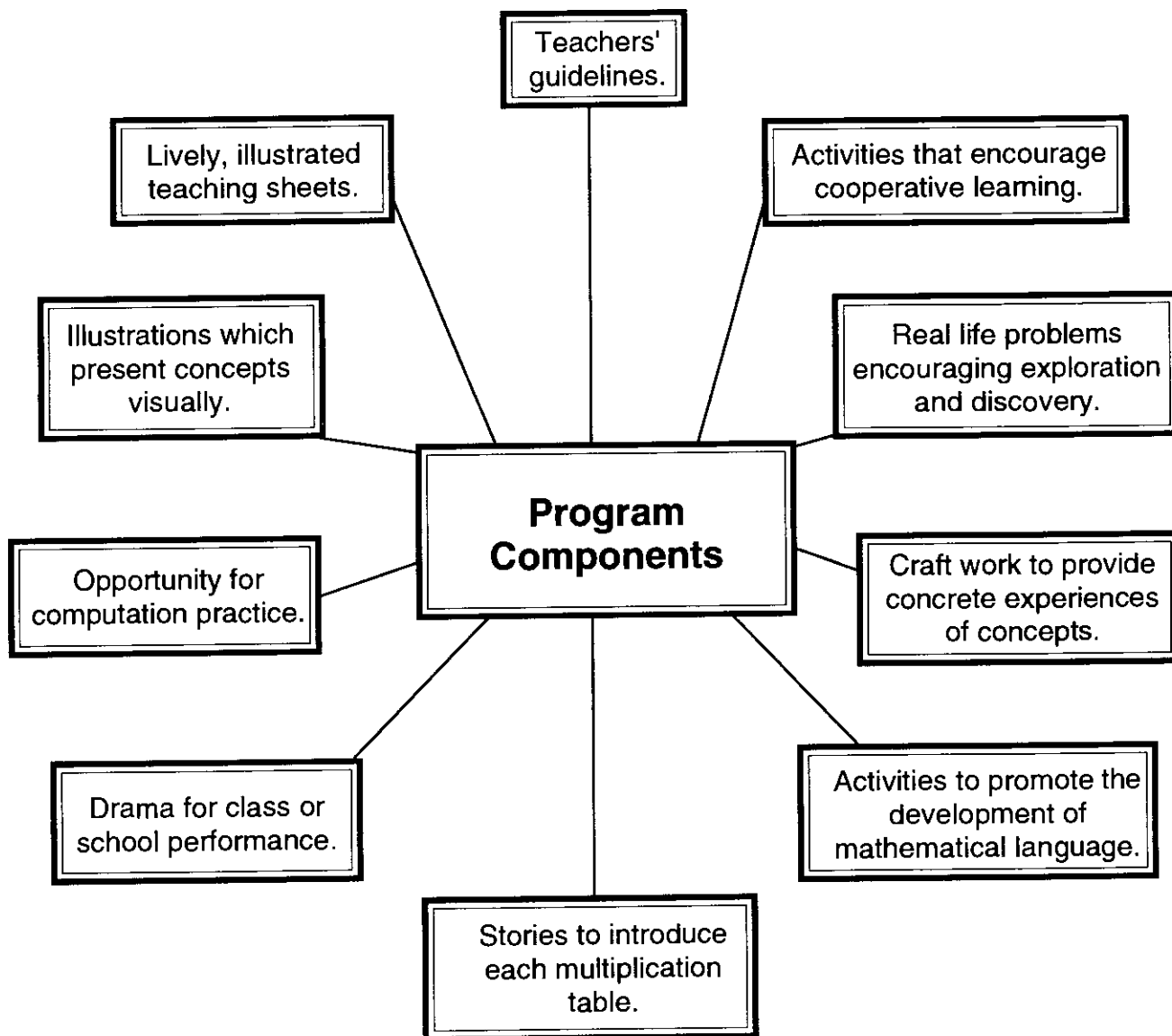
Please feel free to reproduce Sample Sheets in this Teachers' Handbook for use in the classroom.

Program Components

This graphic overview indicates the different types of components found in a Waldorf Education Resource Pack.

The approach is whole language and interdisciplinary and

- encourages cooperative learning.
- aims to involve the student's imagination and creative abilities.
- teaches through the heart, the head, and the hands.
- emphasizes the understanding of concepts and the development of insights.
- stimulates students to discover the beauty of mathematics and in particular the variety of number patterns.



Review taken from Arithmetic Teacher

Arithmetic Teacher - the main journal for the teaching of Arithmetic in the USA - the official publication of the National Council of Teachers of Mathematics Inc., 1906 Association Drive, Reston, VA 22091-1593 USA.

Multiplication Tables by David Mollet & Joyce Mollet. 1993
(Reproducible Masters).

Part 1,	41-pp. loose sheets,	ISBN 0-909001-34-0
Part 2,	41-pp. loose sheets,	ISBN 0-909001-35-9
Part 3,	40-pp. loose sheets,	ISBN 0-909001-36-7
Part 4,	40-pp. loose sheets,	ISBN 0-909001-35-9

“If searching for a new and innovative approach to teaching multiplication facts, look no more. Multiplication Tables introduces the times tables by using whole-language, cooperative-learning, and interdisciplinary methods.

Multiplication Tables is a series of four teaching units for the seven-to-ten year-old student. Each unit is packaged separately in a Waldorf Education Resource Pack. In each resource package, the teacher will find teaching guidelines, stories, student-activity sheets, games, cooperative-learning activities, real-life problems, arts-and craft activities, dramas, opportunities for computational practice, various assessment ideas, and award certificates.

The unit breaks down as follows: Part 1 covers the 2, 3, and 4 tables; part 2 works with tables 5, 6, and 7; part 3 instructs tables 8, 9, and 10; and part 4 teaches tables 11 and 12 and furnishes additional activities for multiplying two-factor numbers.

One of the most important aspects of Multiplication Tables is that it presents facts through various creative formats. The authors believe that this approach will help students develop a love and an understanding of the patterns of mathematics. Should these goals be attained, learning the rules for computation will be accomplished with ease and the lessons will carry over into many other mathematical areas.”

Julie A. Dermosheghian, Mort Elementary School, Tampa, FL 33613

The sequence of teaching followed in the Resource Packs

First Stage

- The first stage is to relate material to the experience of children.
- It is accepted that this experience is different from the adults' experience - children are not miniature adults.
- When teaching adults we would probably teach immediately to the "head", whereas for elementary school children the main task is to teach to the "heart" and "hands".
- Wherever possible, content is introduced so that it relates to artistic and pictorial representation, e.g. through storytelling.
- Through this type of format, information is absorbed in a way that is in empathy with the students' experience.

Second Stage

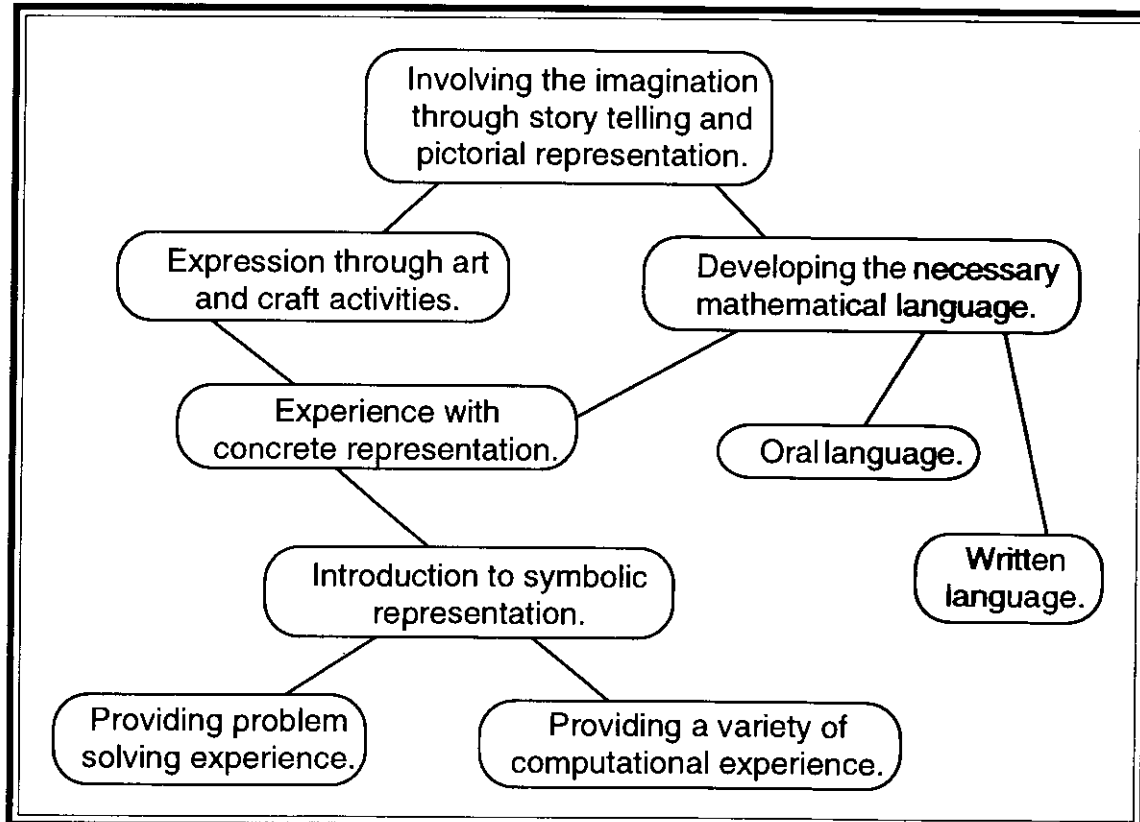
- The second stage is to encourage the students to express their experience through a variety of artistic formats.
- This stage should not be hurried and the children should be given enough time to work through a number of formats according to ability, aptitude and temperament.
- This is the time when patterning activities should be introduced so that the patterns of multiplication are experienced and created.

Third Stage

- The third stage is to work through concrete examples.
- This may be achieved using various kinds of manipulatives, through involvement in activities and games, and through problem solving. Rhythmic activities and chanting would also be appropriate at this stage.

Fourth Stage

- The final stage is to introduce the abstract concepts and to work symbolically with numbers.
- This is when computational practice would be appropriate.



Teachers' Guidelines

Each Multiplication Table module contains a game or activity which is organised by the teacher for the students.

An interesting way of memorising the factors with their products.

Activity designed to reflect the story content.

Type of content icon.

List of equipment required.

Organised in modular form.

Resources provided.

Attractive visual images.

Detailed and clear instructions.

Guidance for teacher preparation.

See page 15 for sample Teachers' Guidelines from Unit 3.6 "Square Dance the Nines".

Stories

The Eight Times Table
Unit 3.3

Story

Spiders' Shoes

There once was an old woman whose name was Mrs Appleby, but nobody seemed to remember that anymore. Now all the children called her the Witchy Woman and made fun of her. Mrs Appleby loved children and it made her sad when she heard them calling her horrible names.

One Tuesday afternoon, school had just finished and all the children were running down the steps and out of the school gates. A young girl named Emily skipped happily alongside her brother Andrew as she waved "hello" to her friends.

Every day Emily and Andrew had to walk past the Witchy Woman's house on the way to their own home. Although neither of them ever yelled anything nasty to Mrs Appleby they still called her the Witchy Woman and would laugh whenever anybody made a joke about her.

That day there was a group of older children waiting home in front of Andrew and Emily. When they reached Mrs Appleby's house they started to laugh and call horrible things across the old iron fence. Andrew and Emily just kept walking and tried to ignore it, but as they passed Mrs Appleby's front gate Emily suddenly stopped.

"Look Andrew," she whispered, "That's the Witchy Woman's feet!"

"Where?" Andrew whispered back, then "Omgosh you're right! But where's the rest of her?" All that Emily and Andrew could see were Mrs Appleby's feet sticking out from behind the house. "What are we going to do Emily?" whispered Andrew.

"We can't just leave her there - she must have fallen over," Emily replied. "We'll have to help her."

"But what if she casts a spell on us and turns us into frogs, or even spiders!" said Andrew. "Yuck!"

Emily and Andrew both knew they would have to go and help Mrs Appleby, whether she was the Witchy Woman or not. So even though the older children were laughing at them, they opened the rusty iron gate and ran around the corner of the house. Mrs Appleby was lying flat on her back, her frizzy grey hair tangled all over her face.

"Umm... are you all right Mrs... umm...?" asked Andrew, very nervously.

"Help me up children," said Mrs Appleby. Andrew and Emily took her hands and helped her to her feet. "Thank you dear," said Mrs Appleby. "I tripped on the garden hose. Won't you come inside for some cake and orange juice?"

"Umm... well I think we'd better... umm... go home thank you, but umm... well..." Andrew stammered.

D WEA 1995

See pages 10/11 for sample story from Unit 3.6 "Zeki and the Cadi".

Student Activity Sheets (TG)

The Twelve Times Table
Unit 3.6

Student Activity Sheet (TG)

The Unfinished Quilt: Activity 1

This is an activity for the whole class. The aim is to create a fabric picture and a written account of your favourite story.

This is what you need:

- a large piece of fabric
- a large sheet of drawing paper
- scissors
- glue
- felt
- wool
- string
- fabric glue

This is what the class does:

- Discuss the stories you have heard while learning the multiplication tables.
- Invite students to vote for their favourite story.
- Count the votes to find the most popular story.
- This is the story that the class will illustrate on the fabric picture, and write about on the drawing paper.

This is how you take part in the activity:

- Study and memorize the 12 times table.
- When you have learned it, you can ask your teacher to write your part of the story on the drawing paper.
- Read the part of the story already written.
- All students tell what happens next part of the story and ask teacher to write it on the drawing paper.
- Listen to what happens next part of the story and ask teacher to write it on the drawing paper.

The fabric picture will be made by everyone in the class. If you are one of the children who have learned the 12 times table, you will help your classmate to make the fabric picture. Don't forget to make a label for the story!

- Sketch on paper something that will illustrate your part of the story and cut it out.
- Take the paper shape from the fabric and draw around it.
- Cut out the shape where you would like it placed on the large piece of fabric.
- Show your teacher where you would like it placed on the large piece of fabric.

D WEA 1995

See pages 12/13 for sample Student Activity Sheets (TG) from Unit 3.6 "Zeki and the Cadi".

Student Activity Sheets (Table Summary)

Based on the theme of the story.

Appealing visual images.

Allows comparison of a linguistic summary with a numerical summary.

Allows students to interact with the material.

Encourages memorizing.

See page 14 for sample Student Activity Sheets (Table Summary) from Unit 3.6

Student Activity Sheets (Cooperative Learning)

Encourages and extends reading skills.

Attractive visual images.

Problems relate to the story content.

User friendly language and age appropriate font.

Opportunity to create problems as well as to solve them.

Encourages and extends writing skills.

Opportunity to answer both numerically and linguistically.

Designed to encourage cooperation and initiative.

See pages 16/17 for sample Student Activity Sheets (Cooperative Learning) from Unit 3.6.

Student Activity Sheets (Patterning)

The image shows two overlapping Student Activity Sheets. The top sheet is titled 'The Three Times Table' and 'Unit 1.4'. It includes a 'Creating Patterns' section with a grid for the 3x3 multiplication table and a small illustration of a person. The bottom sheet is titled 'Two, Three and Four Times Tables' and 'Unit 1.6'. It features a 'Patterns: Four Times Table' section with a grid for the 4x4 multiplication table and an illustration of a king and queen. Callout boxes point to various features of both sheets.

Callout Boxes:

- Icons indicating the activities involved.
- Detailed and clear instructions.
- Opportunity to create the pattern of the multiples.
- Attractive visual images.
- Stimulates discussion.
- Clear font and user friendly language.
- Opportunity to interact with the material.
- Encourages the investigation of patterns.
- Allows students to create the pattern of the multiples.
- Designed to be used together with other tables in a group activity.
- Aids the memorizing of factors and their product.

See page 18 for sample Student Activity Sheets (Patterning) from Unit 3.6.

Student Activity Sheets (Computational Experience)

Appealing visual images.

Age appropriate font.

Builds upon work covered in previous Unit.

Multiplication Activities
Unit 4.5

Student Activity Sheet

Two Place Factors : Part 1

Do you remember how we multiplied with 2 place numbers?

Now we are going to learn to multiply with 2 place factors.

	Step 1	Step 2	Step 3	Step 4	Step 5
$\begin{array}{r} 14 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 13 \\ \hline 42 \\ 30 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 13 \\ \hline 42 \\ 30 \\ \hline 42 \\ 30 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 13 \\ \hline 42 \\ 30 \\ \hline 42 \\ 30 \\ \hline 100 \\ 00 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 13 \\ \hline 42 \\ 30 \\ \hline 42 \\ 30 \\ \hline 100 \\ 00 \\ \hline 182 \end{array}$	$14 \times 13 = 182$

Try these on your own.

$\begin{array}{r} 17 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 13 \\ \hline \end{array}$
$\begin{array}{r} 14 \\ \times 14 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 14 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 14 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 14 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 14 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ \times 14 \\ \hline \end{array}$
$\begin{array}{r} 16 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ \times 13 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ \times 13 \\ \hline \end{array}$
$\begin{array}{r} 17 \\ \times 19 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 19 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 19 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 19 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 19 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ \times 19 \\ \hline \end{array}$

User friendly language.

Clear step-by-step example.

"Fill-in" areas for student work.

Prepares for next developmental stage in following module.

Drama

Icon indicating group activity.

A large cast allowing all members of the class to be involved.

Age appropriate font.

The Four Times Table
Unit 4.5

Princess Straight : Drama

Characters: Princess Straight, Four Wise and Wealthy People, Three Animals, The Dove, Animals

Narrator: Good morning Ladies and Gentlemen. Good you could all be here. I have for you today the delightful story of Princess Straight and her Gates. And here she is. Ladies and Gentlemen - Princess Straight.

Princess Straight: (The crowd roars for Princess Straight as she enters with the dove fluttering behind her.)
I live with my dove.

Dove: (Dove takes a bow)
We live in a castle on top of a mountain. The castle has many towers and towers and is as old as the mountain itself.

Four Wise and Wealthy People: (Four Wise and Wealthy People enter)
I come from the North with precious jewels for you Princess.
I come from the South with gifts of gold.
I come from the East with gifts of silver.
I come from the West with glistening gems.

Narrator: Now Princess Straight was very thankful for these gifts. She said them to buy grain, wheat, and clothing for her people. But then a strange thing happened - the more she gave away the more she received. Before long she began to run out of space to store them.

Princess Straight: (The Four Wise and Wealthy People return and place imaginary gifts around her.)
Princess Straight: (The Four Wise and Wealthy People return and place imaginary gifts around her.)
Princess Straight: (The Four Wise and Wealthy People return and place imaginary gifts around her.)
Princess Straight: (The Four Wise and Wealthy People return and place imaginary gifts around her.)

Princess: I've got a bit of a problem. I need to build a castle wall. I need to build a castle wall. I need to build a castle wall.

Narrator: So the Animals got to work and built a wall with four gates around the castle.

Drama parts written with different readability levels in order to accommodate students with differing reading skills.

Activity allowing students to see the mathematical pattern in yet another way.

Useful visual image.

Zeki and the Cadi

Zeki lives with his wife Ansira and their children in a little mud village about one hundred miles from the city of Ankara in Turkey. I cannot for the life of me remember what the village was called, but that's not important. I've known Zeki and Ansira for years and years. The last time I went to stay with them, Zeki told me a fascinating story - this is how it went.

Zeki had always been a poor man, but one year things got exceptionally bad - his crops were dying, there was nothing to feed the animals, food prices were rising- things weren't looking good at all. So Zeki decided to leave his little mud village for a year, and go to Ankara to make some money.

"I've got a long way to go," he said to Ansira, *"But I will come back a wealthier man. Then we can buy some land and build a little house, own a donkey - do everything we've ever dreamed of doing."*

Ansira and the children were sad to see him go, but they knew it would be worth it.

Zeki set off the next day at a brisk pace. It was 108 miles to Ankara from the little mud village and it took him twelve days to get there. However he hadn't been in the city very long before he got himself a job as a garbage collector. Zeki worked hard all day and slept all night. Each month he received his wages of a bag of nine pieces of silver.

After three months Zeki started worrying that someone might steal his bags of silver while he was working or sleeping, so he decided to take them to the local magistrate - the Cadi - for him to look after.

"Can you keep my money safe, Cadi sir?" he asked.

"Why of course Zeki," said the Cadi, *"You're a very wise man to trust me with your money. I'll keep it very safe indeed."*

So Zeki continued working and taking his bags of silver to the Cadi. He wasn't lonely in Ankara because he met up with a couple of friends who were also trying to save money.

Finally the year was over and Zeki had saved enough money to take home to his family. He went to the Cadi and asked for his bags of silver.

"What bags of silver?" shouted the Cadi, *"You rogue. You vagabond. How dare you? I have no money for you. Get out of my sight before I have you arrested."* Poor Zeki didn't know what to do - but he got out of the Cadi's sight as fast as possible.

The next day, instead of going home to his village, Zeki had to go back to work. Instead of whistling as he collected the garbage, as he usually did, he dragged his feet and had a very sad look about him. That day, as he was collecting trash cans along one of the wealthier avenues of Ankara, he heard a voice.

"What is the matter with you today, Zeki?" It was Mrs. Yakov, a very wealthy woman whose husband was a travelling merchant. Mrs. Yakov was always home when Zeki went past, and she loved to hear his cheerful whistling.

"Nothing's the matter." mumbled Zeki.

"Then why is your face so sad?" asked Mrs. Yakov.

So Zeki told her how the Cadi had tricked him out of his twelve bags of silver.

"That's a lot of money Zeki," said Mrs. Yakov, *"I've got a plan to help you get it back. Tomorrow morning, at nine o'clock exactly, knock on the Cadi's door. When his servant opens the door, just say 'I've come to get my twelve bags of silver from the Cadi.'"*

Mrs. Yakov's plan was as follows. She was going to make sure that she was present when Zeki called. She decided to tell the Cadi that she wanted someone who was very honest to look after all her jewels while she was away visiting her husband.

She even decided to take her jewels with her and show them to the Cadi. She knew that the Cadi would want to impress someone as important as herself and when Zeki came in he would have to act honestly.

As soon as Zeki had his silver, Mrs. Yakov's maid was to rush in and say that their Master had returned unexpectedly and they must return home immediately.

Zeki was unsure of the plan but he had nothing to lose. He was also missing his wife and family a great deal and wanted to go back home to his little mud village, so he agreed and went back to collecting garbage for the rest of the day.

Mrs. Yakov went to her maid and told her about the plan. *"Tomorrow morning I want you to go to the Cadi's house and wait outside until you see Zeki, our garbage collector, come out of the Cadi's house. As soon as he has gone you must rush inside and yell 'Madam. Madam. Sir has come back and wants to see you at once.'"* Mrs. Yakov's maid laughed and agreed to the plan.

The next morning Mrs. Yakov was up bright and early. In a little bag she put all of her most valuable jewelry and then, with a quick wink and a nudge to her maid, she was off down the street to the Cadi's house. She knocked on the door at exactly ten minutes to nine and went in.

"Dear Cadi," she said, *"I need your help. You see, I miss my husband terribly. He's away in Egypt and I do so want to go and see him, but only if I can leave my most valuable and precious pieces of jewelry in your very honest hands."*

The Cadi's greedy eyes lit up as Mrs. Yakov emptied her jewels onto the table. *"Why of course my dear lady,"* he exclaimed, *"I would be absolutely delighted to help you - your jewels will be quite safe with me."*

The Cadi could hardly hide his excitement - soon he would have his hands on all those jewels and later he would pretend they had been stolen. Just then the clock struck nine and there was a loud knock on the door. The Cadi's servant opened it.

"I've come to get my twelve bags of silver from the Cadi," said Zeki in a loud voice. *"Come inside, my dear friend,"* said the Cadi, not knowing what else to say in front of Mrs. Yakov. *"I've come to get my twelve bags of silver,"* Zeki said again.

"Hello Zeki" said Mrs. Yakov *"I see that you also came to the Cadi to leave your money and valuables. I am leaving my valuables here - it is hard to find someone as honest and trustworthy as the Cadi."* Mrs. Yakov was thoroughly enjoying herself.

The Cadi didn't know what to do. He knew that he must appear trustworthy or Mrs. Yakov would not leave her jewels with him. *"Yes of course,"* said the Cadi, who decided that he wanted Mrs. Yakov's jewels quite badly. With a gesture which he immediately regretted he also added *"And because you've worked so hard, I'll give you another six bags of silver to take home with you."*

Zeki didn't know what to say. *"Thank you sir,"* he stammered as he quickly took the silver and left. The Cadi almost hit himself for giving away all that money. But then he remembered Mrs. Yakov's precious jewels.

Suddenly there was another knock on the door and seconds later Mrs. Yakov's maid came rushing in. *"Madam. Madam. Sir has come back and wants to see you at once,"* she yelled.

Mrs. Yakov gathered up her jewelry and put it all back in her little bag. *"Excuse me sir,"* she said, smiling sweetly, *"I must apologize - I had no idea my husband was returning - I must go back to my home at once, but it is so nice to meet someone as honest as your good self."* Still smiling, she left the Cadi's house.

The story quickly spread all around Ankara of how Zeki had managed to get his money back from the Cadi. The greedy Cadi's reputation was ruined. In the end he was so disgraced that he left Ankara and went to live in a little village in the hills.

Twelve days later, Zeki had arrived home to his wife and children. All the family were overjoyed to see him and they all laughed and laughed when they heard the story of how Mrs. Yakov had gotten the better of the Cadi.

And that is the story Zeki told me when I last visited him, Ansira and their family in the little mud village in Turkey.



Zeki and the Cadi : Activities

Making a poster.

For this activity you will need

a large sheet of paper
scissors
colored pencils
silver foil

This is what you do. 

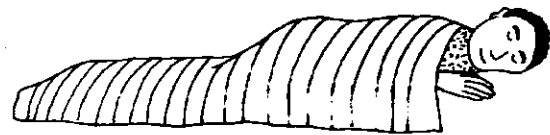
- Draw a symbol which will show Zeki's bag of 9 pieces of silver.
- Keep it as simple as possible. You will have to draw it many times.
- Read carefully the quotations from the story.
- Use your symbol to draw a pattern on your poster for each quotation.
- Above your pattern write the quotation.
- Below your pattern write a sentence to say what your pattern means.
- Write the same sentence using numbers and symbols instead of words.
- Decorate your poster with color, foil and cut-outs to make it more attractive.
- The first quotation has been done for you.

1. "Then why is your face so sad?" asked Mrs. Yakov.
So Zeki told her how the Cadi had tricked him out of his twelve bags of silver.



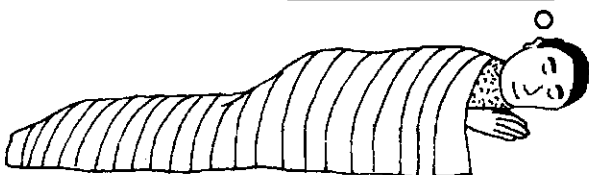
Twelve bags of nine pieces of silver.
 $12 \times 9 = 108$

3. "After three months Zeki started worrying that someone might steal his bags of silver while he was working or sleeping ..."



Take care with number 3. You'll have to do some extra thinking with this one.

2. "Zeki worked hard all day and slept all night. Each month he received his wages of a bag of nine pieces of silver."



4. "...And because you've worked so hard, I'll give you another six bags of silver to take home with you!"





Activity 2

- For this activity you will need to use your imagination.
- Think about the story of Zeki and the Cadi.
- What is the first picture that you think of?
- Keep that picture in your mind and draw it on a large sheet of paper.
- Is it colorful or dull? Is it large or small? Is it full of action, or still and quiet?
- It's all up to your imagination!

Activity 3

For this activity you will need

Seven sheets of strong paper
a frieze of backing paper
colored pencils

Form seven
groups.

This is what each group does

- Choose one of the captions below which are from the story "Zeki and the Cadi".
- Choose one of the group to write out the caption.
- Above the caption draw a picture which shows what is happening.
- Make sure everybody in the group helps with the drawing.
- Sign your names on your group drawing.
- Spend time with your group memorizing the 9 times table.
- When your group can recite the 9 times tables together, you can add your caption and drawing to the class frieze on the wall.
- Be sure to put your caption in the right order.

1. "Can you keep my money safe, Cadi sir?"
Zeki asked.

2. "What bags of silver?!" shouted the
Cadi, "You rogue! You vagabond! How
dare you?!"

3. "Nothing's the matter." mumbled Zeki.
"Then why is your
face so sad?" asked
Mrs. Yakov.



4. "Dear Cadi," she
said, "I need your
help...."

5. "I've come to get my twelve bags of silver from
the Cadi!" said Zeki.

6. Mrs. Yakov gathered up her jewelry and put it all
back in her little bag. "Excuse me sir, I must
apologize - I had no idea my husband was
returning..."

7. All the family were overjoyed to see Zeki and
they all laughed and laughed when they heard
the story of how Mrs. Yakov had gotten the
better of the Cadi.



The whole story will not be told until every group has added their picture.



Table Summary



Poor Zeki had to leave his wife Ansira and their lovely children to go to the city of Ankara for a year to earn some money. His wages were one bag of nine silver pieces every month.

In January	Zeki had 1	bag of 9 silver pieces ---	9 silver pieces in all
In February	Zeki had 2	bags of 9 silver pieces ---	18 silver pieces in all
In March	Zeki had 3	bags of 9 silver pieces ---	<input type="text"/> silver pieces in all
In April	Zeki had 4	bags of 9 silver pieces ---	<input type="text"/> silver pieces in all
In May	Zeki had 5	bags of 9 silver pieces ---	<input type="text"/> silver pieces in all
In June	Zeki had 6	bags of 9 silver pieces ---	<input type="text"/> silver pieces in all
In July	Zeki had 7	bags of 9 silver pieces ---	<input type="text"/> silver pieces in all
In August	Zeki had 8	bags of 9 silver pieces ---	72 silver pieces in all
In September	Zeki had 9	bags of 9 silver pieces ---	<input type="text"/> silver pieces in all
In October	Zeki had 10	bags of 9 silver pieces ---	90 silver pieces in all
In November	Zeki had 11	bags of 9 silver pieces ---	<input type="text"/> silver pieces in all
In December	Zeki had 12	bags of 9 silver pieces ---	<input type="text"/> silver pieces in all

We can write this in a short form.

- 1 bag of 9 silver pieces --- 9 silver pieces in all
- 2 bags of 9 silver pieces --- 18 silver pieces in all
- 3 bags of 9 silver pieces --- silver pieces in all
- 4 bags of 9 silver pieces --- silver pieces in all
- 5 bags of 9 silver pieces --- silver pieces in all
- 6 bags of 9 silver pieces --- silver pieces in all
- 7 bags of 9 silver pieces --- silver pieces in all
- 8 bags of 9 silver pieces --- 72 silver pieces in all
- 9 bags of 9 silver pieces --- silver pieces in all
- 10 bags of 9 silver pieces --- 90 silver pieces in all
- 11 bags of 9 silver pieces --- silver pieces in all
- 12 bags of 9 silver pieces --- silver pieces in all



- 1 x 9 = 9
- 2 x 9 = 18
- 3 x 9 =
- 4 x 9 =
- 5 x 9 =
- 6 x 9 =
- 7 x 9 =
- 8 x 9 = 72
- x 9 =
- 10 x 9 = 90
- x 9 =
- 12 x 9 =



Square Dance the Nines



You will need:

- ✓ 20 cards (10" x 10") with pins or string attached.
Each card should be clearly labelled from 0 to 9 - there should be two cards for each number.
- ✓ Some square-dancing music.
- * Choose twenty students to perform this activity. Repeat the activity so that all students have the opportunity to be involved.
- * The students will need to know the following square-dance movements:



1. 'Do-se-do.'
2. 'right-arm-swing'
3. 'left-arm-swing'
4. 'swing-your-partner'

- * Pin or attach a number on the front of each of the twenty students.

Stage One

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

- * The students form a straight line (in the above order) along the back of the 'stage' area.
- * The music begins.
- * The students take a bow and begin clapping a rhythm.

Stage Two

9 8 7 6 5 4 3 2 1 $\begin{matrix} \uparrow \\ \downarrow \\ \uparrow \\ \downarrow \end{matrix}$ 8 7 6 5 4 3 2 1 0
0 9

- * The teacher and students call the rhyme.
- * Students 0 and 9 come forward.
- * The other numbers side step one pace to fill the space.
- * 0 and 9 carry out the movements in time with the rhyme then return to the ends of the line.

Stage Three

0 9 8 7 6 5 4 3 2 $\begin{matrix} \rightarrow \\ \leftarrow \\ \downarrow \\ \uparrow \end{matrix}$ 7 6 5 4 3 2 1 0 9
1 8

- * The teacher and students repeat the rhyme but change the first two lines to read **"Two times nine is eighteen, One and eight take the floor."**
- * Students 1 and 8 carry through the movements in time with the rhyme, then return to the ends of the line.

The Rhyme

**One times nine is nine,
Zero and nine take the floor!
Now it's time to do - se - do,
Swing by the right ,
Swing by the left,
Take your partner,
Swing them so.
Back to you place,
Off you go!**

Stage Four

- * Stages 2 and 3 are repeated until the students 'nine and zero take the floor!

Stage Five

- * When students 9 and 0 return to the ends of the line the students come forward in pairs stating the factors that make up their product, e.g. 0 and 9 step forward saying **'One times nine is nine!'** and leave the stage. 1 and 8 step forward saying **'Two times nine is eighteen!'** and leave the stage.
- * This continues until the stage is empty.



Cooperative Learning

1. Zeki had to travel 108 miles to reach the city of Ankara where he hoped to make his fortune.



* If he traveled nine miles a day, how many miles did he travel in eight days?

$$\square \times \square = \square$$

* How many days did it take Zeki to reach Ankara?

Answer

$$\square \times \square = \square$$

2. When Zeki reached Ankara, he worked for twelve months as a garbage collector. Each month he was paid one bag of nine pieces of silver.

* How many pieces of silver had Zeki earned at the end of three months?

$$\square \times \square = \square$$

* At the end of seven months the greedy Cadi counted Zeki's money. How many pieces of silver did he count?

$$\square \times \square = \square$$

3. At the end of one year Zeki finally managed to get his bags of silver from the dishonest Cadi.

* How many bags of silver had Zeki earned?

Answer

* How many pieces of silver was that?

$$\square \times \square = \square$$

4. After Mrs. Yakov's help, the Cadi gave Zeki another six bags of silver.



* How many bags of silver did Zeki take back to his family in the little mud village?

$$\square + \square = \square$$

* Can you work out how many pieces of silver that was?

$$\square \times \square = \square$$





Investigating the Number 9

- When Zeki got home and started counting his pieces of silver, he discovered some strange things.
- Do you remember that each bag had 9 pieces of silver?
- Well Zeki found some strange thing about the number 9.



- I discovered that if I multiplied 9 by an even number the product is an even number.
- If I multiplied 9 by an odd number the product is an odd number.

$$\begin{aligned}
 1 \times 9 &= 9 \\
 2 \times 9 &= 18 \\
 3 \times 9 &= 27 \\
 4 \times 9 &= 36 \\
 5 \times 9 &= 45 \\
 6 \times 9 &= 54 \\
 7 \times 9 &= 63 \\
 8 \times 9 &= 72 \\
 9 \times 9 &= 81 \\
 10 \times 9 &= 90 \\
 11 \times 9 &= 99 \\
 12 \times 9 &= 108
 \end{aligned}$$

- * Shade over all the odd numbers in red.
- * Shade over all the even number in blue.



Zeki also discovered that the two numbers of the products add up to 9.



$$\begin{aligned}
 1 \times 9 &= 9 \\
 2 \times 9 &= 18 \dots 1 + 8 = 9 \\
 3 \times 9 &= 27 \dots 2 + 7 = 9 \\
 4 \times 9 &= 36 \\
 5 \times 9 &= 45 \\
 6 \times 9 &= 54 \\
 7 \times 9 &= 63 \\
 8 \times 9 &= 72 \\
 9 \times 9 &= 81 \\
 10 \times 9 &= 90 \\
 11 \times 9 &= 99 \\
 12 \times 9 &= 108
 \end{aligned}$$

- * Carry on adding the two numbers of the product.
- * Either complete the table here or copy the table on to a separate piece of paper and complete.
- * Do they always add up to 9?

Ask an adult to help you with these answers so that you can examine the numbers in the answers.

- ☆ With larger numbers do the numbers of the product add up to 9?

For example.

$$\begin{aligned}
 67 \times 9 &= \\
 49 \times 9 &= \\
 39 \times 9 &= \\
 246 \times 9 &=
 \end{aligned}$$

- ♣ What about these products?
- ♣ Can you find a pattern?

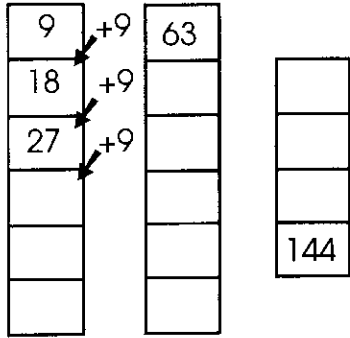
$$\begin{aligned}
 52 \times 9 &= \\
 31 \times 9 &= \\
 121 \times 9 &= \\
 421 \times 9 &= \\
 321 \times 9 &=
 \end{aligned}$$



Patterns : Nine Times Table

Write all the multiples of 9 in these boxes. Start with 9 and carry on until you reach 144.

Once you have filled in the boxes, see how many of these numbers you can find in the chart below. Color each one. Be careful - they appear more than once.



1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

Examples of Content

Table Summary, Cooperative Learning Activity Sheets, Multiplication Patterns, Problems, Computational Exercises and Activities are included for each Table.
(There are also Student Certificates for each Unit).

- SubUnit Multiplication 1 (Tables 2, 3 and 4)
- SubUnit Multiplication 2 (Tables 5, 6 and 7)
- SubUnit Multiplication 3 (Tables 8, 9 and 10)
- SubUnit Multiplication 4 (Tables 11/12+Activities)
- Each SubUnit costs \$24.95 - 4 SubUnits for \$79.95

Material for the USA is printed on US Letter with American spelling.
Material for Australia/New Zealand is printed on A4 with English spelling.
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Quantity	Unit Number	Unit price	Amount
Subtotal			
Sales Tax (CA only)			
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S&H (\$4.00 - 1 Unit \$8.00 - 4 Units)			
Total			

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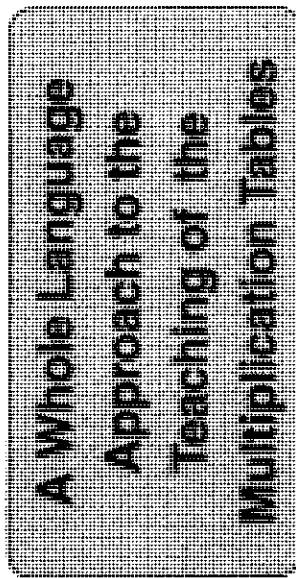
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Do you believe in your own creative ability?

- ♥ If you answer "Yes", examine the Waldorf approach - you will find it worthwhile.
- ♥ Read what teachers and educators have to say about Waldorf methods.

"After more reading and discussions I became quite convinced that the approach is basically a good system for educating our youth. It is certainly worthy of support. I am happy to recommend both the approach and Dr. David Mollet." John H. W., Professor of Education

"I have found the workshop most beneficial - teaching to the right hand side of the brain as well as the left has afforded my students a wonderful approach to learning. I would recommend the workshop to any teacher who is interested in offering his/her students the best education possible." Joan C., 6th & 7th grades

"The concept of the Waldorf approach is of great interest to me. It supports some of the ideas about teaching that I have had for many years. I would sincerely hope that the approach could be made more operational in the school system - I think the approach has some tremendous potential. I would hope that you (David) would have success in implementing the approach in public schools in California. There is definite merit in the approach and it would be of great benefit to students."

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"Highly creative but instinctive and natural - we need these methods now." Ros C., Elementary School Teacher

This workshop has given me a better understanding of how children learn and why. All teachers should take it." Janet P., Elementary School Teacher

"What I learned convinced me that there is a great deal in the approach that would be applicable in any school program. The emphasis on the unique qualities of each child has remained with me and subtly altered my perception of children. I would recommend examination of the approach to all teachers." Joyce M., Superintendent of Schools

- ♥ The following workshops on Waldorf education are available (if needed you can take the courses for credit)

- Teaching the Multiplication Tables in Public Schools - the Waldorf Approach
- Teaching Fractions in Public Schools - the Waldorf Approach
- Teaching Geometry in Public Schools - the Waldorf Approach
- Storytelling - the Waldorf Approach
- Methodology of Teaching - the Temperaments
- Learning to Write and Read : Stages of Child Development
- The Waldorf Approach and the teaching of History
- The Waldorf Approach and the teaching of the Ancient Civilizations

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