

Mathematics

Fractions



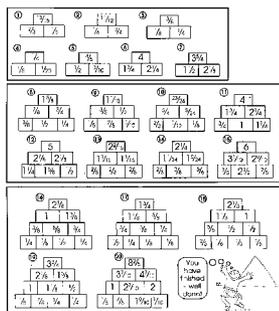
SubUnit 3.4

Drama: A Tale of Fractions

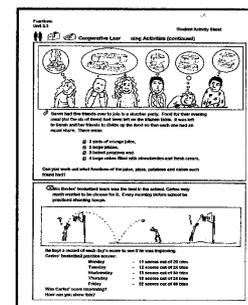
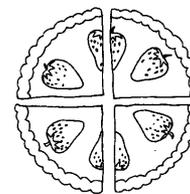
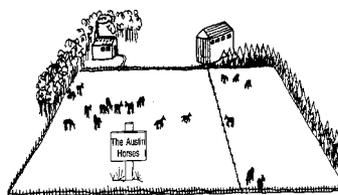
A free lesson/drama involving students in a drama about the Pied Piper of Hamelin

1. Learning about fractions is one of the most challenging tasks for elementary school children. The concepts involved are difficult and complicated. However, it is necessary that children should leave elementary school with a good theoretical and practical grasp of this area. It is crucial that students learn this in ways that relate to their mindset. Our material facilitates this learning in an efficient and sensitive manner.
2. If this is accepted we need to ask two questions. The first - is there a correct time when fractions should be taught or when they should first be introduced? The second - is there an approach or methodology through which children can learn more easily? From the authors viewpoint the answer is in the affirmative to both questions. Yes, there is a correct time to introduce fractions; and yes, there is an approach through which children can learn more easily.
3. We believe that the age to introduce fractions to children is when they are nine/ten years of age. The reasons for this are somewhat complicated and relate to children's growth patterns. Children at this age are losing their holistic and integrated perception of the world. Up until this time children think globally i.e. they perceive and feel themselves to be part of the world. They also see the world as a unity. Teaching needs to relate to this unity and wholeness; indeed an important element is to convey the idea of totality, a wholeness which has various parts. Between the ages of nine and ten the holistic perceptions become fragmented. The teaching of fractions (taught from the whole to the parts) relates to the division and fragmentation of these holistic perceptions. Consequently, this is the ideal time to introduce fractions, for in this subject area we have the experience of taking the whole to parts and then reassembling these various parts.
4. Students need to express they information they learn in a variety of creative, artistic and imaginative formats. By doing this knowledge and skills learned becomes experience and are retained. The material contains a considerable number of student activities and assignments to facilitate this. Students review the material by completing a range of review exercises encompassing a variety of interesting and challenging formats.

Our material is unique and further information is available at
<http://members.cox.net/waldorfedu/waldorfeduPages/Math.html>



$$\begin{aligned} 6\frac{1}{4} &\text{ becomes } \frac{25}{4} \\ \frac{25}{4} + \frac{3}{4} &\text{ becomes } \frac{25}{4} \times \frac{4}{3} \\ \frac{25}{4} \times \frac{4}{3} &\text{ becomes } \frac{25}{3} \\ \frac{25}{3} &\text{ becomes } 8\frac{1}{3} \\ 6\frac{1}{4} + \frac{3}{4} &= 8\frac{1}{3} \end{aligned}$$



Copyright © 2005 Original material ISBN Nos: 0-909001-31-6, 0-909001-32-4, 0-909001-33-2

MLA/WER davidmetis@gmail.com <http://molletacademy.com>

USA: 619-463-1270, 6656 Reservoir Lane, San Diego, CA 92115

NZ: H 09-555-2021m 022-101-1741, 41 Hilling St, Titirangi, Auckland 0604

The vast majority of teachers are responsible, committed and dedicated to their students and teaching. Why aren't they empowered and trusted in the USA? Please visit <http://molletacademy.com/research-reports/> to view research showing countries where students outperform the USA and where spending is almost paltry compared with the USA.

Fractions: Part 1

1.1..Introduction - Teachers' Guidelines (TG).....	1
1.2..Learning About Fractions - TG.....	4
1.3..SubUnit 3 - TG.....	6
.....Fraction Names - (SAS).....	7
.....Practice in Naming Fractions - SAS.....	9
.....Assembling Mobile 1 - TG.....	10
.....Templates for Mobile 1 - SAS.....	11
.....Assembling Mobile 2 - TG.....	12
.....Templates for Mobile 2 - SAS.....	13
.....Assembling Mobile 3 - TG.....	14
.....Templates for Mobile 3 - SAS.....	15
1.4..SubUnit 4 - TG.....	16
.....Writing Fractions - SAS.....	18
.....Numerator and Denominator - SAS.....	19
.....Recognizing Fractions 1 - SAS.....	20
.....Recognizing Fractions 2 - SAS.....	21
.....Fractional Parts of a Set - SAS.....	22
.....Fractions Around Us - SAS.....	23
.....Muffins - SAS.....	24
.....Color of Eyes - SAS.....	25
.....Fractional Parts of Sets - SAS.....	26
.....Comparing Fractions 1 - SAS.....	27
.....Comparing Fractions 2 - SAS.....	28
.....Fraction Chart - TG.....	29
1.5..SubUnit 5 - TG.....	30
.....Distributing the Hay - Story.....	31
.....Distributing the Hay - SAS.....	32
.....Making a Fraction Chart - SAS.....	34
.....Equivalent Fractions 1 - SAS.....	35
.....Equivalent Fractions 2 - SAS.....	36
.....Comparing Fractions 3 - SAS.....	37
.....A Fraction Game - TG.....	38
.....Charts for Fraction Game - TG.....	39
.....The Greedy Farmer - TG.....	40
1.6..Answers - TG.....	41
.....Students' Certificates - TG.....	42

Teaching Fractions : Part 2

2.1..Introduction - Teachers' Guidelines (TG).....	1
2.2..Learning About fractions - TG.....	4
2.3..Sub-Units 3 & 4 - TG.....	6
.....Mixed Numbers - (SAS).....	7
.....Mixed Numbers : Practice Sheet - SAS.....	8
.....Improper Fractions - SAS.....	9
.....Improper Fractions : Practice Sheet - SAS.....	10
2.4..Adding Fractions - SAS.....	11
.....Let's Add Fractions Together - SAS.....	12
.....New Animals at the Zoo - SAS.....	13
.....Easter Eggs - TG.....	15
.....Easter Eggs - SAS.....	16
.....Adding Fractions Using a Chart - SAS.....	17

Pages included in this sample are underlined.

Free Downloads

Go to Home Page <http://molletacademy.com>
for directory of information and free sample lessons.

2.5..Sub-Units 5, 6 & 7 - TG.....	18
.....Subtracting Fractions - SAS.....	19
.....Subtraction - SAS.....	20
.....More Experience of Subtraction - SAS.....	21
2.6..Fraction Circles - TG.....	22
.....Halves - SAS.....	24
.....Thirds - SAS.....	25
.....Quarters - SAS.....	26
.....Fifths - SAS.....	27
.....Sixths - SAS.....	28
.....Eighths - SAS.....	29
.....Tenths - SAS.....	30
.....Twelfths - SAS.....	31
.....Activities Using Fraction Wheel 1-SAS.....	32
.....Activities Using Fraction Wheel 2-SAS.....	33
.....Activities Using Fraction Wheel 3-SAS.....	34
2.7..Addition & Subtraction Puzzles - TG.....	35
.....Addition & Subtraction Puzzles - SAS.....	36
2.8..Answers - TG.....	37
.....Students' Certificates - TG.....	39

Fractions : Part 3

3.1.. Introduction - Teachers' Guidelines (TG).....	1
3.2.. Learning About Fractions - TG.....	4
3.3.. SubUnits 3 and 4 - TG.....	6
..... Cooperative Learning Activities - TG.....	7
..... Cooperative Learning Activities - (SAS).....	8
<u>3.4.. The Pied Piper of Hamelin - Drama.....</u>	<u>10</u>
3.5.. SubUnit 5 - TG.....	13
..... Multiplying Fractions 1 - SAS.....	14
..... Multiplying Fractions 2 - SAS.....	15
..... The Rats of Hamelin - SAS.....	16
..... Let's Go Shopping - SAS.....	17
..... Practice of Multiplication 1 - SAS.....	19
..... Practice of Multiplication 2 - SAS.....	20
..... Practice of Multiplication 3 - SAS.....	21
3.6.. SubUnits 6, 7 and 8 - TG.....	22
..... Sam's Hamburger Party - SAS.....	23
..... Group Learning Activities - SAS.....	24
..... Division of Fractions 1 - SAS.....	25
..... Division of Fractions 2 - SAS.....	26
..... Practice of Division 1 - SAS.....	27
..... Practice of Division 1 - SAS.....	28
..... Practice of Division 1 - SAS.....	29
3.7.. Multiplication/Division Puzzles - TG.....	30
..... Multiplication/Division Puzzles - SAS.....	31
3.8.. Poetry - TG.....	32
3.9.. Answers - TG.....	33
..... Students' Certificates - TG.....	34



Mathematics: Fractions

Email David at davidmetis@gmail.com

These 20 e-lessons are based on the Waldorf Teaching Packs: Fractions

Details of Fractions at <http://molletacademy.com/fractions/>

You will find these icons at numerous places throughout the Lesson. Please explain them to your students.



Preparation time for teachers



Writing activities for students.



Opportunities to work in groups



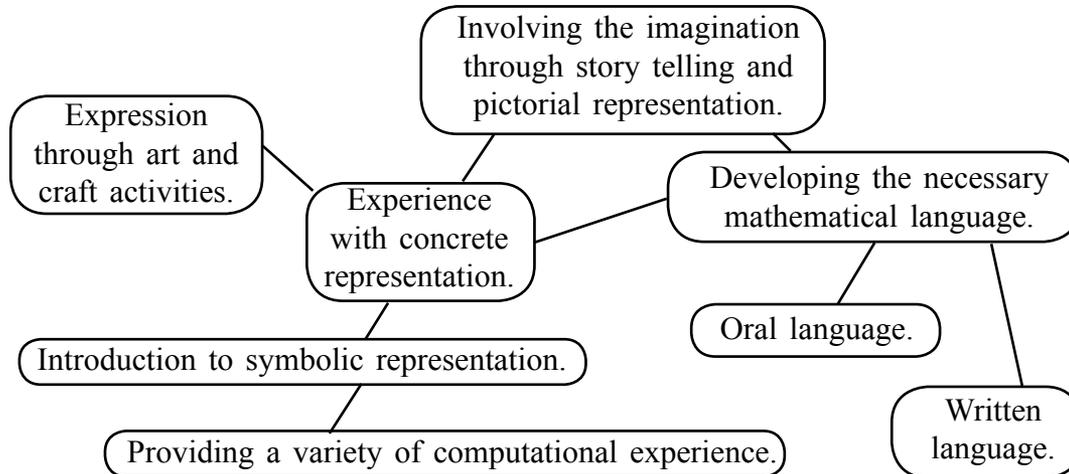
Information for students.



Instructions for a craft activity.



Drawing or coloring activities for students.



The approach we advocate asserts that there is a “right time” to introduce content of different subject areas. This is usually determined by the child’s stage of all-round development (including emotional, social, psychological and physical) and not just cognitive growth.

The approach therefore differs from conventional approaches in that decisions regarding when a topic or concept is introduced are made with regard to far more than just the academic attainment or intellectual development of children. They are made by taking into account the all-round development of children.

They are also made after asking quite different questions than those normally asked. The educator might ask the question: "Is this child ready to handle this content at this particular time?"; whereas the teacher using our approach would find this question somewhat irrelevant, and would tend to ask such questions as: "What will help us feed and enrich this child at this particular stage of development?"

How should fractions be taught?

Children of seven to thirteen live very much in the world of feeling. Before this, their earlier years have been dominated, to a great extent, by the "will"; from around seven the affective comes to the fore; after puberty the intellectual activity predominates.

The elementary school child’s world is also one of color and pictorial representation; consequently approaches such as story-telling, which stimulate children's imagination, are to be recommended. You will find in this teachers’ resource pack such an approach. The sequence in teaching a new concept is usually as follows.

First Stage: The first stage is to relate material to the experience of the student. It is accepted that this experience is different from the adults’ experience.

In essence children are not miniature adults. When teaching adults we would probably teach immediately to the "head" whereas for elementary school children we need to teach to the "heart" and "hands".

Wherever possible, content is introduced so that it relates to artistic and pictorial representation. One way of doing this is through story-telling where the students’ imagination is stimulated.

However, it should be added that a subject area such as fractions does not lend itself to the formulation of stories as easily as, for example, history does although wherever possible stories and dramas are included. 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. Some children will want to do this quickly; others will want to take their time.

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.

Third Stage: The third stage is to work through concrete examples.

Fourth Stage: The final stage is to introduce the abstract concepts and to work symbolically with numbers.



Characters

Narrator

Pied Piper

9 Grey Rats

2 Black Rats

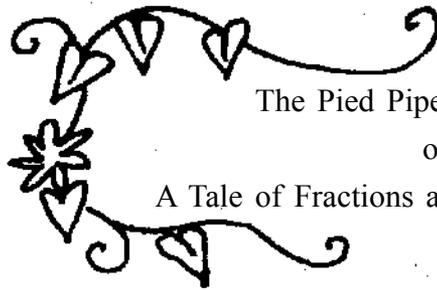
3 Patchy Rats

3 Splotchy Rats

1 White and Brown Spotted Rat

18 children (played by the same students who take the parts of the rats)

A number of Townspeople



The Pied Piper of Hamelin

or

A Tale of Fractions and Settling Accounts



Narrator: "Once upon a time, long ago and far away, a town called Hamelin was plagued by rats. There were all sorts of rats - grey ones, black ones, patchy ones and splotchy ones, and a white and brown spotted one - but they were all big and all horrible."

Grey Rats: "We are the grey rats, there are nine of us and we are horrible!"

Black Rats: "We are the black rats, there are two of us and we are horrible!"

Patchy Rats: "We are the patchy rats, there are three of us and we are horrible!"

Splotchy Rats: "We are the splotchy rats, there are also three of us and we are horrible!"

White and Brown Spotted Rat:
"I am the white and brown spotted rat. I live alone and am cautious and careful, clever and canny and I trust no-one. I'm horrible too."



All the rats in unison:
"We are the rats of Hamelin.
We are 18 in all: grey and black, patchy and splotchy."

White and Brown spotted rat:
"And don't forget white and brown spotted!"

(Each set of Rats moves into a group away from the rest as they speak.)

Grey Rats: "We are the most important rats. We are half of all the rats in Hamelin."

Black Rats: "We are two eighteenths of all the rats. We think we're important."

White and Brown Spotted Rat:
"They really mean a ninth, and that's a much smaller group than a half."

Patchy Rats: "There are more of us, we are three eighteenths of all the rats."

White and Brown Spotted Rat:
"They really mean a sixth, but they're quite right - that's a larger group than a ninth."

Splotchy Rats: "We're the same sized group so we guess we're a sixth as well."

White and Brown Spotted Rat: "I'm only an eighteenth of the rats in Hamelin, the smallest group, but I make up for that because I'm clever and canny, cautious and careful."

Narrator: "Well, the townspeople of Hamelin

were quite sick of all the rats - wouldn't you be?"

Rats: "No!"

Townspeople:
"Yes!"

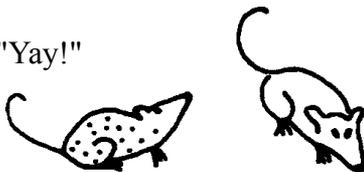
Narrator:
"So the townspeople called in the Pied Piper rat disposer. The advertisement in the yellow-pages said the Pied



Piper could get rid of any rat, anywhere, any time. The only trouble was that the Pied Piper was quite expensive, but the townspeople said they didn't mind."

Townspeople: "Yay!"

Rats: "Boo!"



Narrator: "Here comes the Pied Piper."

(Pied Piper enters. Townspeople are welcoming. Rats act scared. Pied Piper starts playing. Rats look interested.)

Narrator: "The Pied Piper had a magic flute which mesmerized the rats. They had to follow the Pied Piper, they couldn't help themselves."

(Pied Piper leads rats around the room.)

Narrator: "The Pied Piper led those rats through the streets of Hamelin. All the houses were empty of rats - they were all following that amazing flute. The Pied Piper walked through the city. One third of the rats were run over by cars and trucks on the way out of the city."

(The Patchy Rats and the Splotchy Rats fall down.)

Narrator: "So twelve rats (two thirds of the Rats of Hamelin) were left following the Pied Piper. On and on they went until they came to a river. The Pied Piper leapt over the slimy rocks that stuck out of the river and kept on playing. The twelve rats had to follow. One sixth of the rats that were following slipped and slided and sloshed into the river and that was the end of them."

(The Pied Piper leaps over the "river". The rats follow and the Black Rats fall in.)

Narrator: "So five sixths of the rats who had survived the inner city traffic were left following the Pied Piper. Now the Pied Piper led them on a roundabout and boutaround way until they came to a huge cliff by the sea. The Pied Piper stood at the edge of that cliff and kept on playing and playing."

(Rats keep walking until they fall off the edge of the cliff. They act as if they don't want to but can't help themselves.)

Narrator: "Nine tenths of the rats that were left fell off the edge of that cliff and that was all of the rats gone! Except one."

White and Brown Spotted Rat: "Being a clever and canny, cautious and careful rat, I hid and watched and when I saw what happened I ran away."

(Pied Piper plays a little tune and turns away from the cliff)

Narrator: "Now the Pied Piper returned to the town of Hamelin to give them the bill."

(The Townspeople enter. The Pied Piper walks up to them - takes a bill from his pocket and gives it to one of the townspeople.)

Narrator: "The townspeople weren't sure anymore that they wanted to pay all that money. They had got rid of the rats, now they wanted to get rid of the Pied Piper."



(The Townspeople act shocked at the bill, some laugh, some are angry. They shoo the Pied Piper away.)

Narrator: "No, no, that's no way to treat a Pied Piper! You'll be sorry!"

(The Townspeople laugh at the narrator. The Pied Piper walks to the corner of the stage and plays a little tune.)

Narrator: "The Pied Piper knew more than one tune."

(Six children come and dance around the Pied Piper.)

Narrator: "One third of the town's children came to listen to the magic flute. In another minute six more children joined them. This made two thirds of the town's children."

(Six more children come and dance. The Pied Piper starts to lead them around.)

Narrator: "As the Pied Piper walked out of Hamelin, more and more of the town's children joined in the dancing and skipping and jumping.

(Six more children join the group.)

"When the last third of the children joined in, the Pied Piper had all of them. Thank goodness it was a holiday and there wasn't

much traffic about."

(All of the town's children follow the Pied Piper. There is one child with a limp who is last.)

Narrator: "This time the Pied Piper went a different way. The children followed that magic flute to the bottom of a huge cliff which was covered in flowering vines."

(The Pied Piper takes the children to the cliff face and stops playing.)

Narrator: "The Pied Piper played a sad and quiet tune now. Slowly, the cliff opened up and inside the children could see the most beautiful land with lots of long grass and tall trees and colorful flowers. The Pied Piper led them inside and the cliff shut behind them."

(The children look happy and dance inside, but the last child with the limp is too slow and is shut out.)

Narrator: "But there was one little child who was too slow. This child had to walk back to town alone. Just one eighteenth of the town's children remained."

(The Last Child limps back sadly and is greeted by the Townspeople who are very sad too.)

Narrator: "So that is the story of how a whole town came to lose all but an eighteenth of its rats and because the townspeople were too mean to pay even a fraction of the bill, they also came to lose all but an eighteenth of their children."

