

If, after having divided an apple into halves, I divide each half into two equal parts, how many parts shall I have?

Ans. 4.

Each part is called a *quarter* or a *fourth*.

To make one apple, how many quarters or fourths of an apple are required?

**OBSERVATION.**—It is necessary to familiarize the child with these words, *half*, *third*, *fourth*, and to endeavor to give him a precise idea of them, by making him take a certain part of some whole; for example, of a roll of paper, of a piece of wood, &c. The different kinds of unity should be varied as much as possible, in order that the pupil may not regard fractions absolutely, but merely as they relate to the unity employed.

Having taken 3 different objects as units, divide one of them into 2 equal parts, another into 3, and the third into 4; form them into 3 groups, and desire the child to point out a *half*, a *third*, *two thirds*, a *quarter*, *two quarters*, *three quarters*. These objects may be apples, small wands, or cubes. Let him also compare these different fractions with reference to size, by asking him which is the larger, a half or a third? a third or a quarter? two thirds or three quarters? &c. The object here is not to teach him to find the difference with great exactness; it is sufficient for him to know that a *half* is more than a *third*, a *third* more than a *quarter*; for the greater number of parts there are in a unit, the smaller they are; that three quarters are more than *two thirds*, &c., &c.

### II.—Conversion of Whole Numbers into Fractions.

How many half apples are there in 2 apples?

The same question upon 3, 4, 5, 6 apples, &c.

How many half feet are there in 2, 3, 4, 5, 6 feet?

How many thirds are there in 2, 3, 4, 5, 6 apples?

How many thirds are contained in 2, 3, 4, 5, 6 yards?

The same question may be asked respecting quarters.

How many parts would there be, if each half were divided into 3?

Ask the same question, if they were divided into 4, 5 parts.

How many parts would there be, if each third were divided into 2, 3, 4, 5, 6 equal parts?

Ask the same questions, if each quarter be divided.

**OBSERVATION.**—The pupils should perform these operations themselves, either upon apples or some other objects. As a great quantity of apples would be necessary for such operations as these, cards may be used, divided into as many parts as are requisite; but it is better not to cut them entirely through, in order that the child may preserve the idea of unity formed by the re-union of the several parts. Lines may now be used; they are more convenient than objects.

*Repeat all together.*

1 whole is equal to	2 halves.
2 wholes make	4 "
3 "	6 "
4 "	8 "
5 "	10 " &c., &c.
1 whole is equal to	3 thirds.
2 wholes make	6 "
3 "	9 "
4 "	12 "
5 "	15 " &c., &c.
1 whole is equal to	4 quarters.
2 wholes make	8 "
3 "	12 "
4 "	16 "
5 "	20 " &c., &c.
1 whole is equal to	5 fifths.
2 wholes make	10 "
3 "	15 "
4 "	20 "
5 "	25 "
6 "	30 " &c., &c.

### III.—Conversion of Fractions into Whole Numbers.

How many apples are there in 3 half apples?

Ans. 1 apple and a half.

Let the same question be asked respecting 4, 5, 6, 7, 8, 9, 10 halves, &c.

The children will easily perceive that they must find how many

times 2 halves are contained in the number of halves of which the wholes are to be formed. This may be done first by allowing them to put two halves together to make a whole, then two more, and so on, until all have been counted. But they must not be told.

They should also be required to find how many wholes there are in a certain number of thirds, of fourths, and of fifths.

#### *Simultaneous repetition.*

Halves.		Halves.
2 make 1 whole.	1 whole is equal to	2
3 " 1 " and a half.	1 " and a half make	3
4 " 2 wholes.	2 wholes make	4
5 " 2 " and a half.	2 " and a half make	5
6 " 3 wholes.	3 " make	6
7 " 3 " and a half.	3 " and a half make	7
8 " 4 wholes.	4 " make	8
9 " 4 " and a half.	4 " and a half make	9
10 " 5 wholes.	5 " make	10
Thirds.		Thirds.
3 make 1 whole.	1 whole is equal to	3
4 " 1 " and 1 third.	1 " and 1 third make	4
5 " 1 " and 2 thirds.	1 " and 2 thirds make	5
6 " 2 wholes.	2 wholes make	6
7 " 2 " and 1 third.	2 " and 1 third make	7
8 " 2 " and 2 thirds.	2 " and 2 thirds make	8
9 " 3 wholes.	3 " make	9
10 " 3 " and 1 third.	3 " and 1 third make	10
Quarters.		Quarters.
4 make 1 whole.	1 whole is equal to	4
5 " 1 " and 1 qr.	1 " and 1 qr. make	5
6 " 1 " and 2 qrs.	1 " and 2 qrs. " "	6
7 " 1 " and 3 qrs.	1 " and 3 qrs. " "	7
8 " 2 wholes.	2 wholes are equal to	8
9 " 2 " and 1 qr.	2 " and 1 qr. make	9
10 " 2 " and 2 qrs.	2 " and 2 qrs. " "	10
Fifths.		Fifths.
5 make 1 whole.	1 whole is equal to	5
6 " 1 " and 1 fifth.	1 " and 1 fifth make	6
7 " 1 " and 2 fifths.	1 " and 2 fifths " "	7
8 " 1 " and 3 fifths.	1 " and 3 fifths " "	8
9 " 1 " and 4 fifths.	1 " and 4 fifths " "	9
10 " 2 wholes.	2 wholes are equal to	10

### IV.—Conversion of Fractions from one Denomination to another

**OBSERVATION.**—The analysis in the following exercises must be made slowly, by the children themselves, upon objects, under the guidance of the teacher.

How many quarters are there in 3 thirds?

Ans. 3 thirds make 1 whole; 1 whole is equal to 4 quarters.

How many thirds are there in 4 halves?

Ans. 4 halves make 2 wholes; 2 wholes make 6 thirds.

How many quarters are there in 6 halves?

Ans. 6 halves make 3 wholes; 3 wholes make 12 quarters.

How many halves are there in 6 thirds?

Ans. 6 thirds make 2 wholes; two wholes make 4 halves.

How many halves are there in 6 quarters?

Ans. 6 quarters make 1 whole and a half, or 3 halves.

### V.—Addition of Fractional Numbers.

One apple and a half, and one apple and a half, make how many apples?

2 apples and a half, and 2 apples and a half — ?

3 wholes and a half, more 3 wholes — ?

4 wholes and a half, more 3 wholes and a half?

1 whole and a half, more 1 whole and a half, more 1 whole and a half — ?

2 wholes and a half, more 4 wholes and a half — ?

2 wholes and a half, more 2 wholes and a half, more 2 wholes and a half — ?

3 wholes and 2 thirds, more 2 wholes and 1 third — ?

3 wholes and 1 third, more 2 wholes and 2 thirds, more 2 wholes and 1 third — ?

5 wholes and 2 thirds, more 5 wholes and 2 thirds, more 1 third?

3 wholes and 1 third, more 2 wholes and 2 thirds, more 3 wholes and 1 third?

3 quarters, more 3 quarters?

2 quarters, more 1 whole and 2 quarters?