**Lower Elementary:**

*Question:* There are 100 green leaves on a tree. Half of them turn orange one day, and half of the remaining green leaves turn orange the next day. How many leaves of each colour are there now?

**Upper Elementary:**

*Question:* There are 1024 leaves on a tree. On the first day, half of the leaves fall to the ground. Each day that follows, half of the remaining leaves fall to the ground. On what day will there be only 1 leaf left on the tree?

**Middle School:**

*Question:* One puppy weighs 6 kilograms and 680 grams and another puppy weighs 7 kilograms and 930 grams. What fractional part of the total weight of both puppies is the lighter puppy?

**Algebra and Up:**

*Question:* There is an 0.5% chance of snow in Winnipeg and a 75.5% chance of snow in St. John’s. What is the percent chance that it will snow in either Winnipeg or St. John’s, but not both?

**Lower Elementary:**

*Question:* There are 100 green leaves on a tree. Half of them turn orange one day, and half of the remaining green leaves turn orange the next day. How many leaves of each colour are there now?

*Answer:* 75 orange leaves and 25 green leaves

*Solution:* The first day, half of 100 = 50 leaves turn orange. The second day, half of 50 = 25 leaves turn orange. So, now there are 50 + 25 = 75 orange leaves. The remaining 25 leaves are still green.

**Upper Elementary:**

*Question:* There are 1024 leaves on a tree. On the first day, half of the leaves fall to the ground. Each day that follows, half of the remaining leaves fall to the ground. On what day will there be only 1 leaf left on the tree?

*Answer:* the tenth day

*Solution:* To solve this problem, we find the number of times we need to halve the leaves in order to get down to 1. On the first day, half of 1024 = 512 stay on the tree. If we continue the process, we find that 256 are left on the tree the second day, 128 the third day, 64 the fourth day, 32 the fifth day, 16 the sixth day, 8 the seventh day, 4 the eighth day, 2 the ninth day, and only 1 leaf left on the tree the tenth day.

**Middle School:**

*Question:* One puppy weighs 6 kilograms and 680 grams and another puppy weighs 7 kilograms and 930 grams. What fractional part of the total weight of both puppies is the lighter puppy?

*Answer:* 668/1461

*Solution:* A kilogram is 1000 grams. So, the lighter puppy weighs 6 × 1000 + 680 = 6680 grams. The heavier puppy weighs 7 × 1000 + 930 = 7930 grams. So, the puppies weigh 6680 + 7930 = 14 610 grams in total. As a fraction, the lighter puppy weighs 6680/14 610 of the total weight of both puppies. We can reduce the fraction by dividing both the numerator and denominator by 10 to get 668/1461.

**Algebra and Up:**

*Question:* There is an 0.5% chance of snow in Winnipeg and a 75.5% chance of snow in St. John’s. What is the percent chance that it will snow in either Winnipeg or St. John’s, but not both?

*Answer:* 75.245%

*Solution:* The chance of snow falling in either place but not both is the sum of the probability it’ll happen in each place minus the probability it’ll happen in both places. The sum of the probabilities that snow will fall in each location is 0.5% + 75.5% = 76%. The probability that snow will fall in both places is twice the product of each location’s probability of snow, which is 2 × 0.5% × 75.5% = 0.755%. So, the probability of snow falling in either place, but not in both, is 76% – 0.755% = 75.245%.