The Yellow and Green Gourds
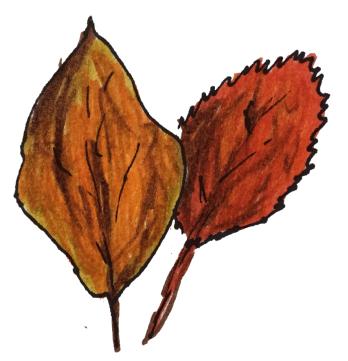
Illustrations by Adele Long

The Yellow and Green Gourds

Sophie was outside sitting under a tree remembering what a good time she and Norman had at Irma & Ezra's farm stand. Sophie realized that she had learned a lot about numbers and solving problems too. She was hoping to visit the farm stand again. Things turned out even better than she had hoped; that very day her parents told her that they would be visiting their friends who lived next to the farm stand this weekend.

The fall leaves were at their most colorful and their friends really wanted to share the beautiful scene. Sophie thought it would be mean not to invite Norman. After all, Norman was starting to like math more and this was because helping Ezra showed him that knowing math was often the key to solving important problems. Sophie phoned Norman to invite him. She waited while he asked his parents, if he could go. Sophie could almost see him smiling when he told her "YES!!"

As they arrived at the farm stand Sophie's mom stopped the car. Ezra and Irma waved hello and Norman and Sophie jumped out. Sophie's mom said, "Sophie and Norman, when you are finished at the farm stand walk down to the farm. We will be in the field behind the red barn."

Irma walked Sophie and Norman over to the stand, where she showed them the vegetables they were selling. "This week we have the most beautiful gourds for sale," Irma said, pointing to a giant basket overflowing with bright, colorful gourds.

"Wow, these **are** beautiful!" Sophie said.

"The gourds have many different shapes and two different colors," Ezra explained, "green and yellow. I think the customers are really going to like them."

As Sophie and Norman got a closer look at all of the shiny gourds and their interesting, unique shapes and sizes, a young woman drove up, parked her car, and walked over. She said with excitement: "I'm Trish and I love gourds! I have to bring some home, they are just so gorgeous!"

Ezra walked over to Trish with a smile, "How may I help you?"

"I think I'll buy **6** of your gourds today," Trish said.

"You got it!" Ezra exclaimed, "Do you care what colors they are?"

"Well...how about the same amount of each color? I'll take **3** green gourds and **3** yellow gourds, because **3** plus **3** equals **6** gourds, right?" Trish asked.

"Right!" Ezra said as he reached into the basket and pulled out **3** green gourds and **3** yellow gourds and put them in a bag for Trish to take home.

She smiled and started to walk towards Irma at the cash register, but then suddenly turned around.

Trish said, "You know, I really love the way the yellow gourds look. I think I want to have **more** yellow gourds than green."

Ezra nodded and started to put more yellow gourds into Trish's bag.

"Wait, sorry, if I confused you. I still only want to have **6** gourds altogether, I just want to have **more** yellow ones than green." she declared.

Ezra scratched his head, "Well, umm, I guess I have to think about that for a minute…"

Ezra's head started to swirl thinking about how to give the customer more yellow gourds than green without giving her more than **6** altogether. But before he made any progress with this problem, a new customer walked over to him.

"Hello, my name is Stan. I'd like to buy some gourds today," he said.

"How many would you like?" Ezra asked.

"I think I'd like to have **8**. But I am not sure how many of each color I want. What are my options?" Stan asked.

Ezra looked over at the giant baskets of green and yellow gourds and started to feel overwhelmed. He turned to Sophie and Norman and said, "Do you think you could help Trish? She wants **6** gourds and she wants more yellow than green. Meanwhile I will help Stan."

"Sure," said Norman, before Sophie could even think about it.

Norman quickly walked over to Trish and said, "Why don't you give me all your green gourds and I will trade them for the same number of yellow gourds. Then you will have more yellow than green gourds." Norman stood there with a satisfied smile.

Trish said, "But then I won't have **ANY** green gourds. I don't want to do that."

Norman sat on the edge of a bin and rubbed his chin. "I didn't think of that," he said.

Just then Sophie stepped up and said, "In school, we are learning how to make numbers in different ways. Maybe we can think about the ways to make **6**. Maybe that will help us figure out how you can have more yellow gourds but still have green ones too."

1. What ideas do you have for how Sophie and Norman can help Trish with her gourds?
1a. How many ways can they make 6 and have more yellow than green gourds?

Meanwhile, Ezra was trying to figure out how many ways Stan could have **8** gourds. "Well, you could have **8** yellow gourds or you could have **8** green gourds," suggested Ezra.

"I really want to have some of each," said Stan.

"I was afraid of that," thought Ezra.

Just then Sophie and Norman walked over. Trish had gone happily on her way home with **4** yellow and **2** green gourds. Norman and Sophie heard what Stan wanted and wondered whether Ezra could use their help.

Sophie was starting to think about the new problem and didn't realize she was talking out loud, "Stan could take **1** yellow and **7** green. That will give him **8** gourds."

Stan scratched his head and replied, "Yes, that will give me **8** gourds and some of each color. But before I make up my mind, I want to know what other choices I have beside **1** yellow and **7** green."
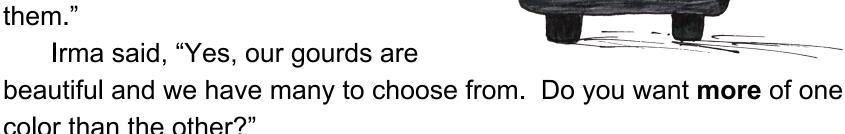
*2. Can you help Sophie and Norman figure out how many ways Stan can get **8** gourds?*

Stan decided he would take **5** green and **3** yellow gourds. He had almost reached his car when he turned around. Walking up to Sophie and Norman, Stan said, "You know, I think I want the **same** number of green and yellow gourds. Can you help me with that?"

"I think so," Sophie said.

3. Can you help Sophie and Norman figure out how Stan can have the same number of yellow and green gourds?

As Stan drove away, Ezra and Irma came over to where Sophie and Norman were standing. Irma said, "We have been watching you two and I think we have some new ideas about how to solve these kinds of problems. Thanks for your help."

A woman with two young children emerged from a red SUV that had just pulled into the farm stand. The woman walked up to everyone and said, "Hello, my name is Lily. I hear you have beautiful gourds. I would like to buy **9** of them."

Irma said, "Yes, our gourds are beautiful and we have many to choose from. Do you want **more** of one color than the other?"

Lily thought about this for awhile and said, "Actually, I would like the **same** number of green and yellow gourds."

Irma looked at Ezra and said, "I think you are ready to help Lily pick out her gourds." Then she walked back to the cash register. Sophie and Norman looked at each other. Both were thinking that this might not be so easy.

Ezra grabbed a bag and put **8** yellow and **1** green gourd in it. He said to Lily, "Okay, you can have **8** yellow and **1** green. But hold on there's more ways to do this."   He took **1** yellow gourd out of the bag and put in a green one instead. Then he dumped all the gourds out on the table and counted **7** yellow and **2** green.

"How about **7** and **2**?" Ezra asked Lily.

"No, I don't think so," Lily replied, "That would give me **more** green. I want the **same** of each."

Ezra looked over at Norman and Sophie. Norman was looking down at the ground because he was thinking about the problem. Sophie was picturing **9** gourds and realized something about the problem.

*4. What do you think Sophie realized when she pictured **9** gourds? What are your ideas about Lily wanting **9** gourds with the same number of green and yellow?*

It was almost time for Sophie and Norman to walk down to the farmhouse. Just then a man in a truck pulled up to the farm stand. He got out of the truck and said, "My name is Malcolm and I would like to buy some gourds."

Ezra, hoping this would be an easy order, asked, "How many gourds do you want?"

Malcolm said, "I know I want **10** gourds. I'm not quite sure about how many should be green and how many should be yellow. But I know that whatever combination I get, it has to be an **even** number of green and an **even** number of yellow gourds."

Ezra's head was starting to spin. A new kind of problem, he thought. "An **even** number! What is **THAT**?" he wondered, "Aren't all numbers just numbers?"

Norman was not sure what an **even** number was. He was thinking it must be numbers that had curves in them. Looking at everyone, Norman said, "I think **2** and **3** and **5** and **6** and **8** and **9** must be even. They all have a curved part and so they are not uneven. **1** and **4** and **7** are all straight, pointy, and kind of odd."

Malcolm smiled and said, "I see how you can think that about **odd** and **even**. But the way the numbers look is not what I mean."

Malcolm went on, "I want to put **2** gourds in the front windows of my house. Every window will have **2** gourds of the same color. Green with green and yellow with yellow. I don't want any window to have a green and yellow gourd. So when I buy gourds I pair them up. Every gourd is with one other of the same color. To pair gourds with one of the same color they have to be an **even** number."

Sophie and Norman looked at each other. They could both picture the gourds all in pairs.

"I think I am starting to understand **odd** and **even** numbers," laughed Sophie.

"Me too." said Norman, "I want to start putting gourds in pairs."

*5. Can you help figure out how many different ways Malcolm can make **10** gourds with even numbers of both yellow and green gourds?*

It was time for Sophie and Norman to walk down to the farm. They knew that they had several jobs to do at the farm. They walked over to say goodbye to Ezra and Irma. They found them unpacking a large wooden box filled with orange gourds.

"Well," said Irma, "It looks like our gourd problems just got more complicated."

Sophie looked at Norman and said, "Imagine that, trying to figure out how many ways someone can buy **three** different color gourds."

Norman was excited to try and said, "Why don't we see if we can work this out as we walk. I wonder how many ways you could have **7** gourds, if you wanted **some** green, **some** yellow, and **some** orange?"

*6. How many ways can you combine green, yellow, and orange to make **7** gourds? You have to use some of each color.*