

The **Mystery** of the **Missing** **Hummingbirds**



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Elementary  GLOBE™

Before we begin, be sure to have your thermometer datasheet and a red crayon ready.

“Our classroom is too hot,” complained Simon. He opened a window and a warm breeze rushed in.

Ms. Patel said, “Isn’t it funny that even though it’s August and school has started, it’s still summer? Class, what does summer mean to you?”

Dennis raised his hand, “Swimming at the pool makes me think of summer,” he said.

“It is still light out after dinner so I can play outside. That’s what summer means to me,” commented Anita.

Simon added, “Seeing lots of flowers, bees, and butterflies in the garden reminds me of summer.”

“Great answers,” commented Ms. Patel.



The thermometer shows a temperature of approximately 85 degrees Fahrenheit (29 degrees Celsius). The calendar is for the month of August, with the days of the week labeled at the top: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday. The dates are arranged in a grid format.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

“One of our projects this school year is to come up with a scientific investigation about how our school’s garden changes during summer, fall, winter, and spring. Let’s go outside now to observe the garden in summer. Be sure you have your journal and a pencil.”



The garden has different colors
in autumn than in summer.

The thermometer outside the school shows the current temperature as 30 degrees Celsius. On your datasheet, color the August thermometer to 30 degrees.

Notice that there are two sets of numbers on the thermometer. The scale on the left measures temperature in Fahrenheit. Most people in the US use this scale.

However, scientists use the Metric scale on the right that measures temperature in Celsius. Because we are scientists making and recording observations, we will use the Metric side of the thermometer. An easy way to remember Metric readings is:

30 is hot

20 is nice

10 is chilly

0 is ice

The class went outside to the garden to make their observations.

“I smell flowers,” said Simon.

“I hear birds chirping,” said Dennis. “Hey, where did Anita go? She was just here but now I don’t see her.”

Ms. Patel wandered around the garden to watch what the children were recording in their journals.

When she got to the bench where Anita was sitting, Anita said “Look at all the hummingbirds around the feeder! They are my favorite bird. I am drawing one and have questions that I want to answer.”

Ms. Patel commented, “Wow, Anita, I love all the details you are putting in your hummingbird sketch.”



Here is Anita's sketch

She started thinking about the hummingbird as she drew its picture and a million questions filled her head.

She wrote a few in her GLOBE journal so she could look them up later.

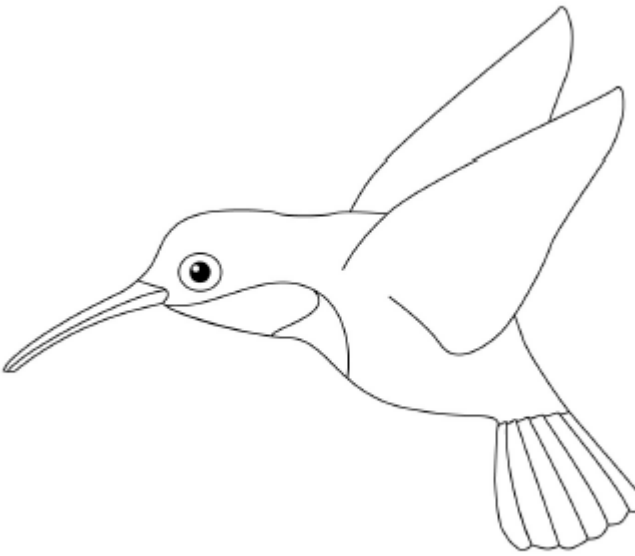


Honing In On Hummingbirds Student Activity Sheet

What I want to
know about
hummingbirds...

What do they eat? _____
How fast do they fly? _____
Where do they sleep? _____

This is a Ruby Throated Hummingbird.



Anita looked up with a sparkle in her eye.

“This bird is so cool, Ms. Patel! Listen to the buzzing from its wings – I had no idea hummingbirds were that noisy! I also didn’t know how small they are – this one is smaller than my hand!”

Simon looked up from his journal and said, “Here we go again! Last year Anita always talked about critters in the soil. I guess this year it’s going to be hummingbirds.”



When Anita got back to the classroom, she looked up the hummingbird and found a really nice picture of one just like she saw in the garden.

She showed the picture to the class.

She was very excited about all she was learning about these very fast, tiny little birds.

Ruby Throated Hummingbird



A few months later, Anita rushed into class to find Ms. Patel. Ms. Patel said, “Anita, you look upset. What is wrong?”

Anita replied, “They’re gone!” “Who is gone?” asked Ms. Patel.

“The hummingbirds! Ever since I saw them in our garden, I’ve been watching them every day. Sometimes I see them by the flowers and sometimes they are by the hummingbird feeder, but I always see them somewhere. Where are the hummingbirds? It has been three days and I haven’t seen any!” Anita exclaimed.

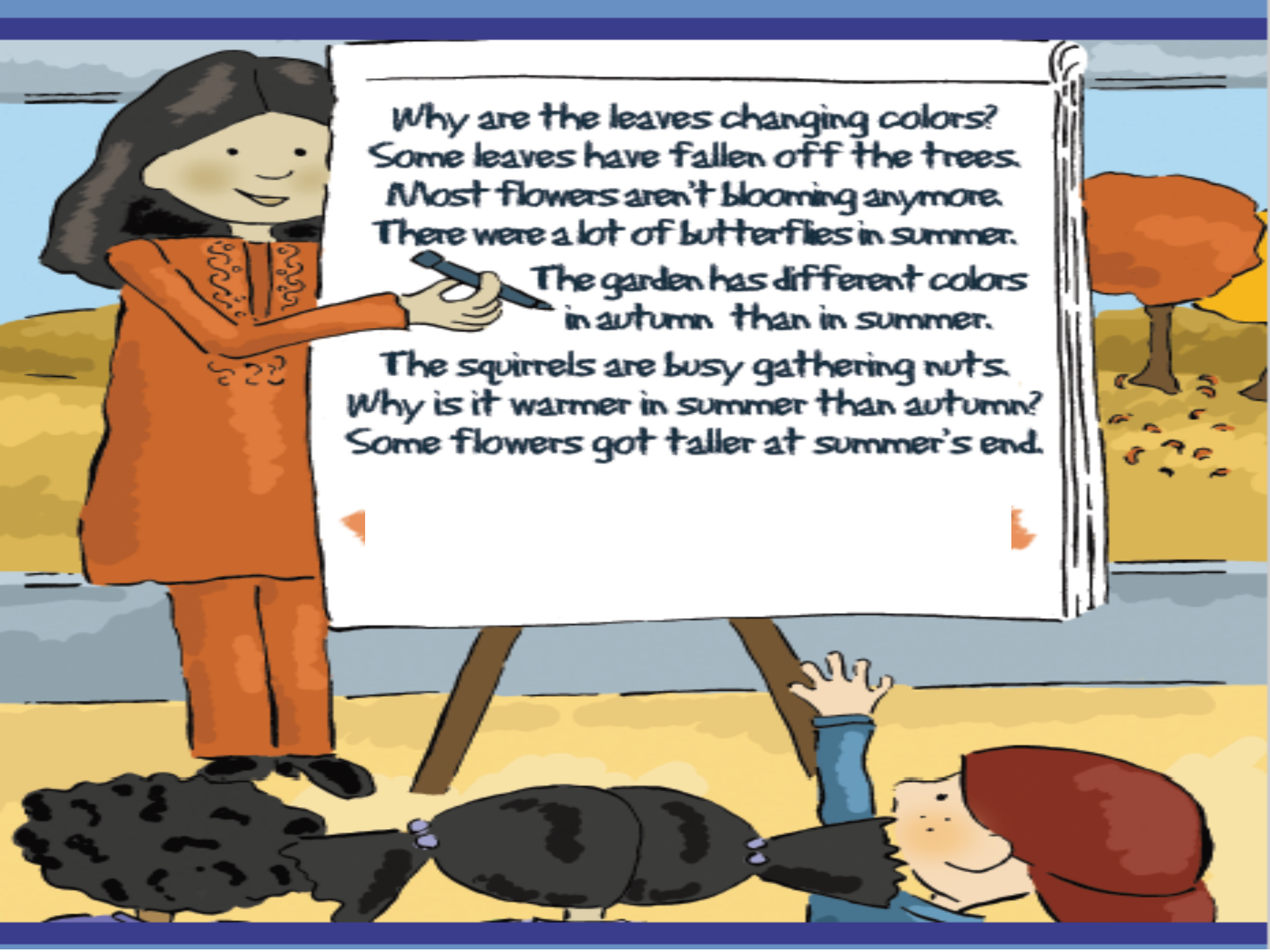


“Slow down, Anita,” said Ms. Patel calmly as the bell rang and the other students came into the classroom. “I am not sure what has happened to the hummingbirds, but your question comes at the perfect time. Today our class is going to choose a question for our science investigation. Tell the class about this hummingbird mystery. It might make an interesting investigation.”



When the class was seated, Ms. Patel said, “We have made observations in our garden during the seasons of summer and autumn,” she told the class. “What kinds of changes have you noticed? Use your journals to write some ideas, then we will choose a question for our science investigation.”

As the students took turns describing their observations and asking questions, Ms. Patel recorded their ideas on a chart.

A woman with long dark hair, wearing an orange dress with decorative patterns, stands on the left side of the image. She is pointing with her right hand towards a large white sign on a wooden stand. The sign contains text about autumn. In the background, there is a tree with orange leaves and some fallen leaves on the ground. The scene is set outdoors with a blue sky and a yellow ground.

Why are the leaves changing colors?
Some leaves have fallen off the trees.
Most flowers aren't blooming anymore.
There were a lot of butterflies in summer.

The garden has different colors
in autumn than in summer.

The squirrels are busy gathering nuts.
Why is it warmer in summer than autumn?
Some flowers got taller at summer's end.

Anita raised her hand and said, “I am worried about the hummingbirds. They used to be in the garden or at the feeder, but I haven’t seen any for days.”

Dennis replied, “Me, too! I wonder if something has changed in our garden that made the hummingbirds go away?”

The whole class chimed in that they agreed with Anita and Dennis.

“Well, it sounds like we have our research question. First the hummingbirds were in our garden and now they are gone. We will investigate why they left and where they went.”

Where did the hummingbirds go?

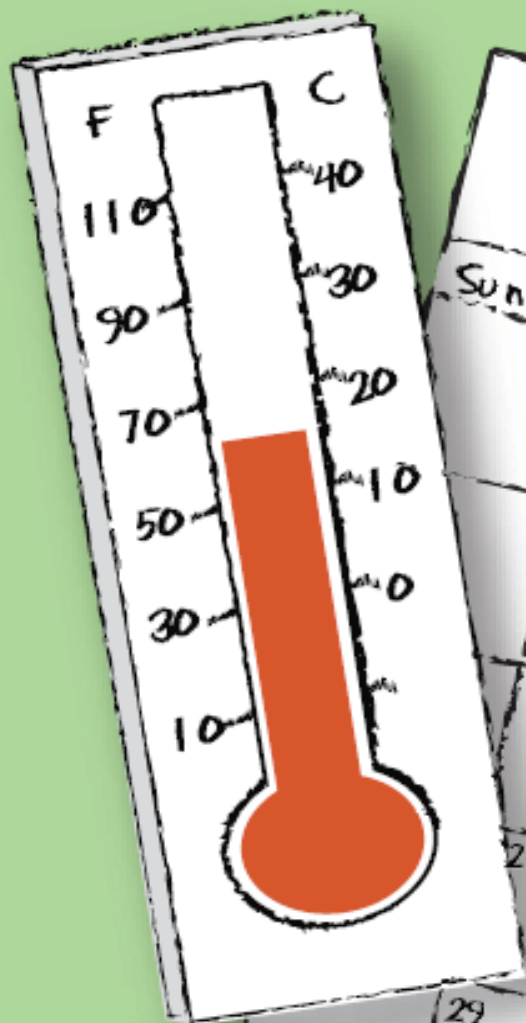
The thermometer outside shows the current temperature as 15 degrees Celsius. On your datasheet, color the October thermometer to 15 degrees.

30 is hot

20 is nice

10 is chilly

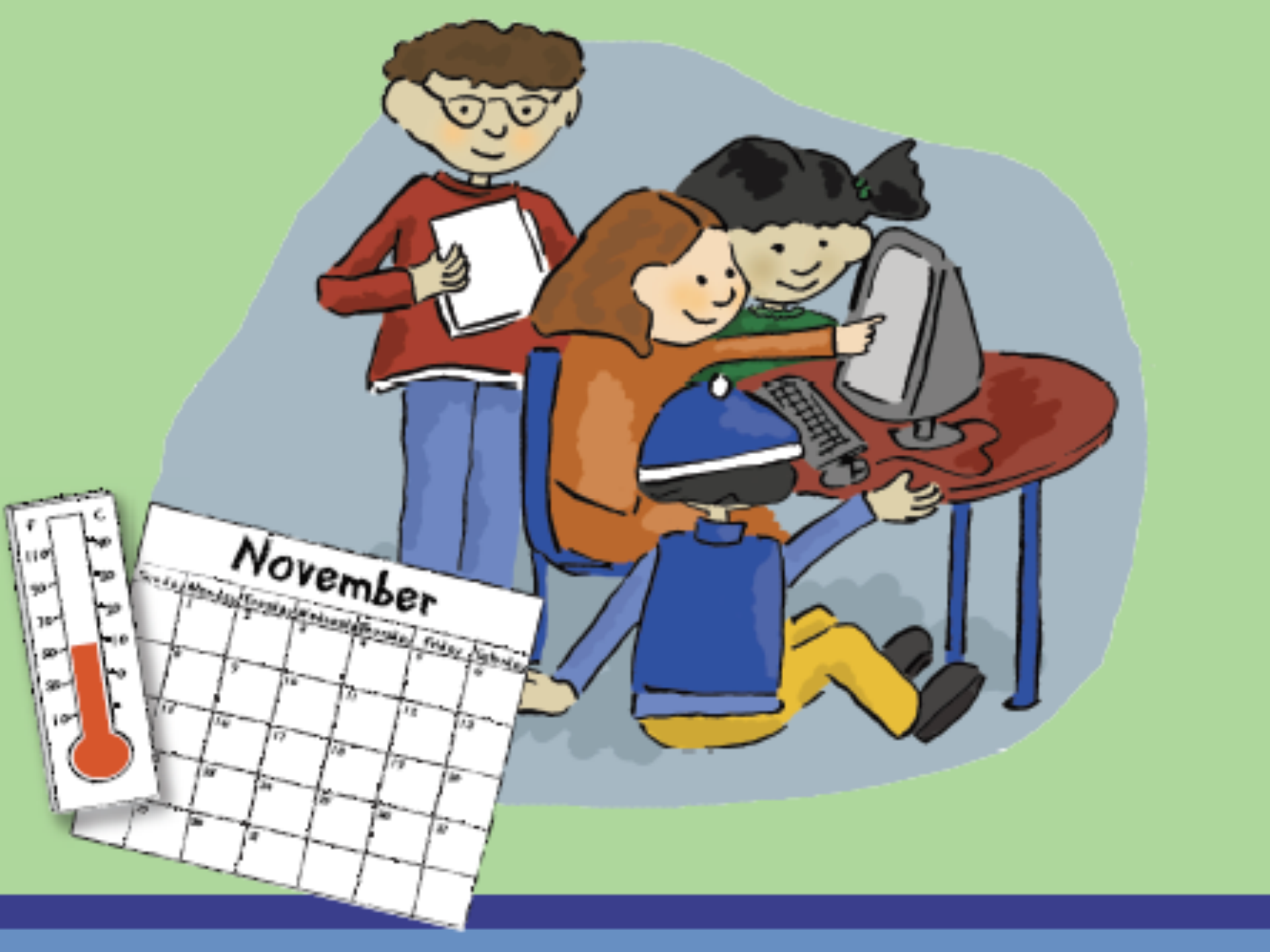
0 is ice



October

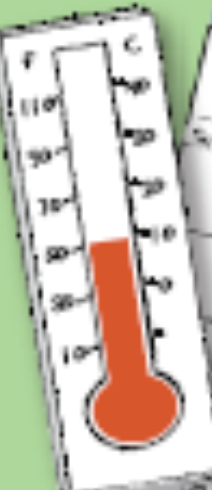
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
8	9	10	11	12	13	
15	16	17	18	19	20	
22	23	24	25	26	27	
29	30	31				

“It’s going to take some work to answer this question,” said Dennis. “We’ll all have to work hard,” Anita agreed.



November

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



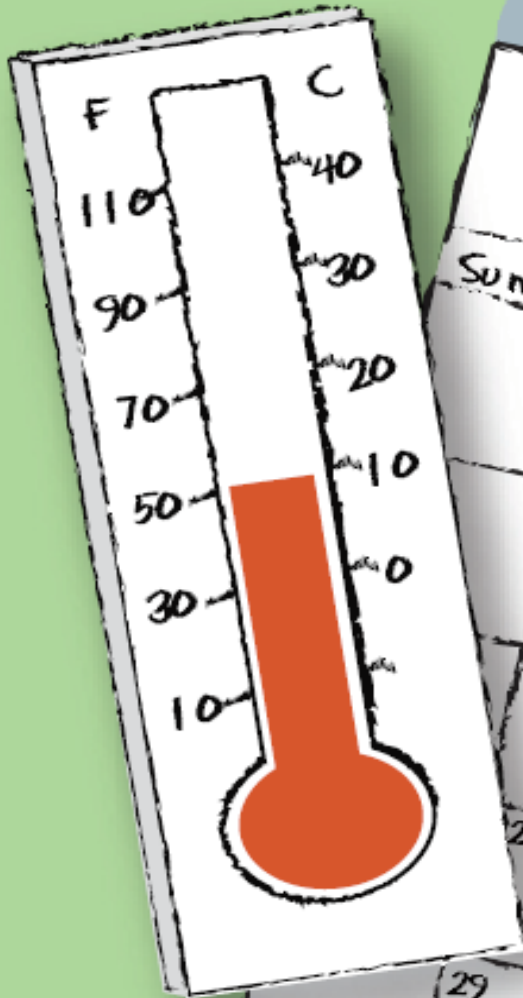
The thermometer outside shows the current temperature as 10 degrees Celsius. On your datasheet, color the November thermometer to 10 degrees.

30 is hot

20 is nice

10 is chilly

0 is ice



November

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
8	9	10	11	12	13	
15	16	17	18	19	20	
22	23	24	25	26	27	
29	30	31				

Ms. Patel put the students into three groups.

Anita's group did Internet research in the computer lab.

Dennis' group went to the school library to gather information from books and maps.

Simon's group sent out emails to friends and family around the country to see if any of them had information on these hummingbirds.





When the class shared their research findings a few days later, each group was bursting with excitement about what they had learned.

Anita gushed, “We know that only the adult male ruby throated hummingbird actually has a red throat and that’s how they got their name.”

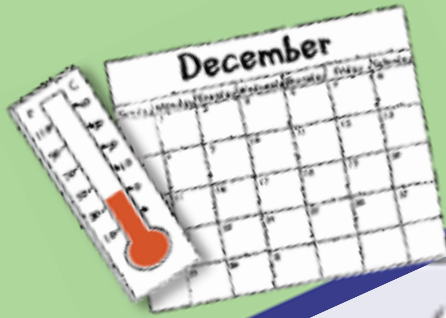
Next, Dennis explained, “We learned that they migrate south to Mexico and other countries in Central America. They leave here in Pennsylvania by October and don’t come back until spring.”



Last, Simon's group shared that they talked to family and friends from around the United States. They learned that the tiny little birds had also left those places.

Simon added, "My Uncle Bill lives in South Carolina, and he saw one there a few weeks after we saw our last one. We also emailed my cousin Ernesto in Costa Rica to find out if ruby-throated hummingbirds live there in the winter."

The class could hardly wait to hear back from Ernesto. They hoped he could help them solve this mystery.



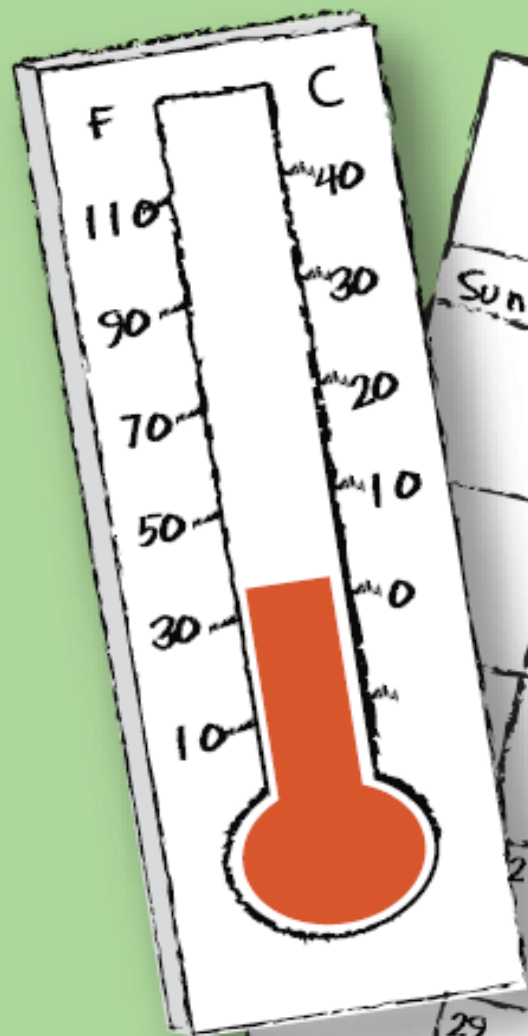
The thermometer outside shows the current temperature as 1 degree Celsius. On your datasheet, color the December thermometer to 1 degree.

30 is hot

20 is nice

10 is chilly

0 is ice



December

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

In Costa Rica, Ernesto's teacher Señor Chavez said to his class, "Buenos días, clase. Ernesto has some news for us from his cousin in the United States. They have asked us to do some research for them!"

Ernesto read Simon's email out loud and then said, "My cousin Simon asked us to make some observations outside. We need to find out if their hummingbirds have migrated here."

By the way, our Spanish word for this kind of bird is "colibrí garganta rubí."

Escuela de Guanacaste

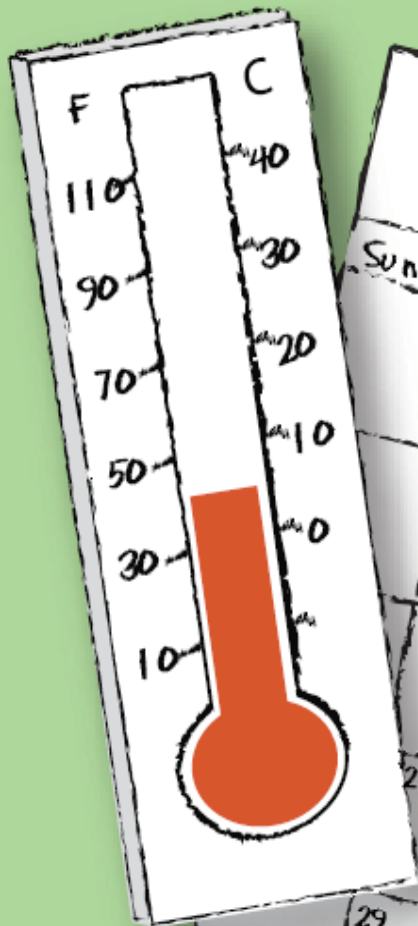


OK, because the students in Pennsylvania are working with students in Costa Rica, now we have two thermometers being used for observations.

The thermometer on the left is from the GLOBE school in Pennsylvania and shows the current temperature as 5 degrees Celsius. On your datasheet, color the January thermometer to 5 degrees.

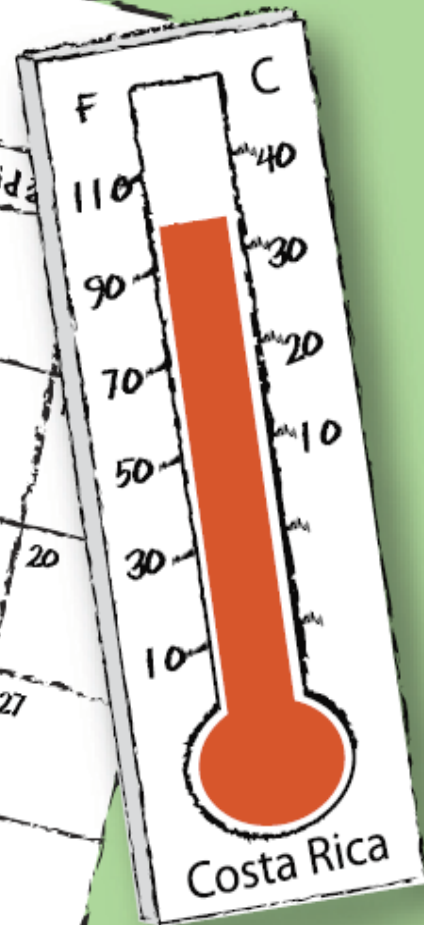
The thermometer on the right is from the GLOBE school in Costa Rica and shows the current temperature as 32 degrees Celsius. On your datasheet, color the January thermometer for Costa Rico to 32 degrees.

**30 is hot
20 is nice
10 is chilly
0 is ice**



January

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	1	2	3	4	5
8	9	10	11	12	
15	16	17	18	19	20
22	23	24	25	26	27
29	30	31			



It's January and if we find red throated hummingbirds, Simon wants to know what the birds do down here."

Señor Chavez smiled, "This will be a great way to learn more about what is happening outside our school! Hopefully, we can also learn from Simon's class what it is like where they live. Let's take our journals outside and record what we find."

Outside, some of the students made sketches of the different flowers, trees, and other plants they saw. Others went to their instrument shelter and recorded the current temperature. They saw hummingbirds and took pictures to email Simon to show that the ruby-throated hummers were at their school. Ernesto's class went inside to record their data and to send information back to Simon's class.



Back in the U.S., it was a cold wintery February day in Ms. Patel's classroom.

Anita was staring at the empty bird feeder covered with snow.



Again, we have two thermometers being used for observations.

The thermometer on the left is from the GLOBE school in Pennsylvania and shows the current temperature as 6 degrees Celsius. On your datasheet, color the February thermometer to 6 degrees.

The thermometer on the right is from the GLOBE school in Costa Rica and shows the current temperature as 34 degrees Celsius. On your datasheet, color the February thermometer for Costa Rica to 34 degrees.

30 is hot

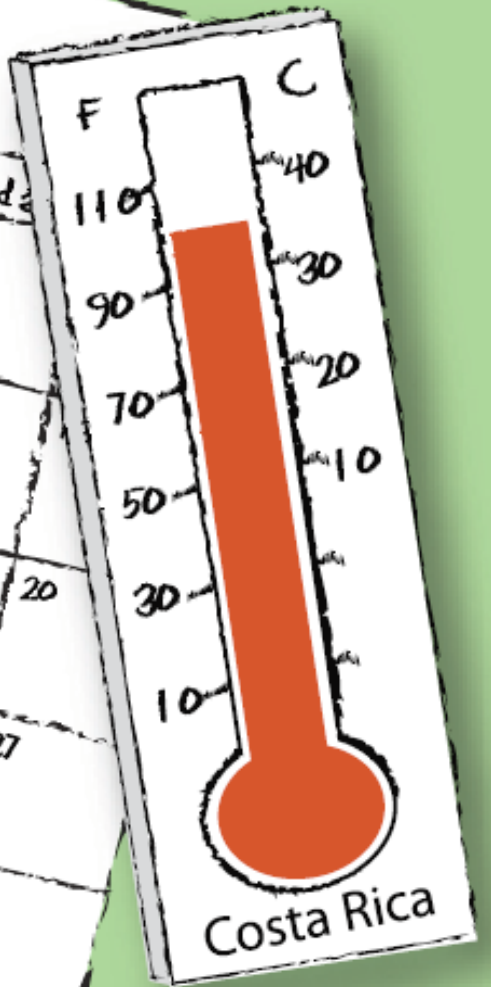
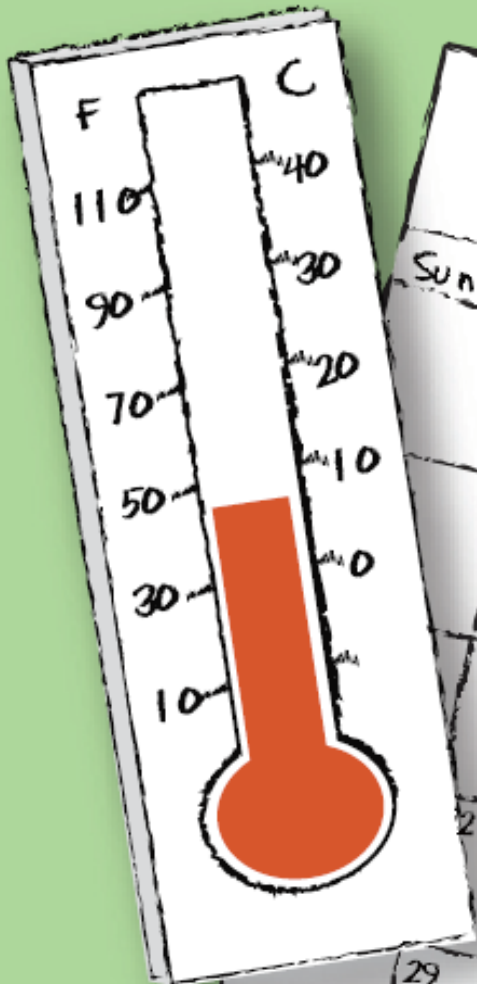
20 is nice

10 is chilly

0 is ice

February

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	1	2	3	4	5
8	9	10	11	12	
15	16	17	18	19	
22	23	24	25	26	27
29	30	31			



Simon said, “Ms. Patel! Look at this email I just got from Ernesto. His class has seen some ruby-throated hummingbirds. They made an observation chart for us and he even sent a picture of the hummingbird!”

The class gathered around Simon to see.

Dennis said, “The landscape looks so different there compared to what it looks like here in winter.”

“Do you think they know how different it is here?” asked Anita.

“We should send them a February weather chart about where we live,” said Simon.



We saw ruby-throated hummingbirds!

Where: Our school's garden in Costa Rica

**Plants that we saw:
Jocote trees, turk's cap, and lantana**

**The weather was:
27 degrees Celsius (80°F), sunny, hot, no rain**

We saw 7 birds perched in shrubs and on Jocote tree branches. They drank nectar from flowers, hovered around the bird feeder, and flew around the students in the garden.

The birds were 8 cm (3 in) long and had long, thin beaks. Some have a red spot on their throats.



During the next few months, the two classes wrote to each other. Anita always looked forward to the pictures they received of the ruby-throated hummingbirds. She missed them.

One day, Simon got an email from Ernesto that said, “Be on the alert! The ruby-throated hummingbirds have been eating lots of insects instead of nectar. We learned that’s because they are preparing for their long journey north.”

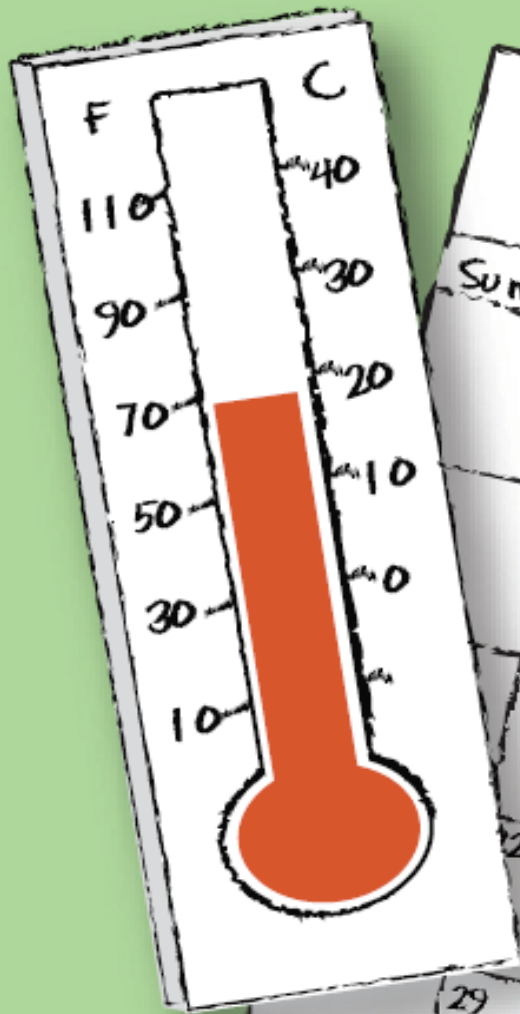


Escuela de Guanacaste

It's now April – spring – in Pennsylvania.

The thermometer on the left shows the current temperature as 19 degrees Celsius. On your datasheet, color the April thermometer to 19 degrees.

**30 is hot
20 is nice
10 is chilly
0 is ice**



April

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
8	9	10	11	12	13	
15	16	17	18	19	20	
22	23	24	25	26	27	
29	30	31				

Over the next few weeks, the class started to notice flowers blooming and green leaves on the trees.

One sunny day, the students were in the garden, sketching flowers & animals and collecting weather data at the instrument shelter.

Anita heard a loud buzzing noise. Right away she knew it was a hummingbird! “They’re back!” Anita exclaimed.

Simon added, “Let’s send an email to Ernesto’s class to let them know the birds are arriving safe and sound.”

Ms. Patel said, “And after that, let’s figure out why it was time for the hummingbirds to come back here. In your season journals you have all the information you need to figure out this mystery.”



In the classroom, the students posted information about the seasons and the hummingbirds.

Ms. Patel added the information Ernesto's class sent about Costa Rica. Then they looked at all the information.

The hummingbirds were in their garden only when flowers and other plants were blooming and there were insects around.

They decided that hummingbirds stay where they have enough food and shelter.

HUMMINGBIRDS

Needs

blooming flowers
insects to eat
tree leaves to live in

They can't get these things here during our winter so they go to Central America

SUMMER

lots of hummingbirds

leaves are green

lots of flowers

hot outside

AUTUMN

hummingbirds go away

leaves turn colors

plants lose flowers

cool outside



“You have done a wonderful job,” announced Ms. Patel. “Do you all realize that you have been scientists this year? You made observations, asked a question, collected data, shared your results, and made conclusions. I am very proud of you.”

Anita smiled and added, “This was so much fun. And even though the hummingbirds will leave again next autumn, they will always come back in the spring.”

WINTER

Here-
no hummingbirds,
bare trees
no flowers
cold outside

in Costa Rica-
lots of hummingbirds
green leaves
blooming
flowers
hot outside

SPRING

Hummingbirds
return!
leaves bud on trees
flowers
start to
bloom
warm outside



It's June – summer is right around the corner in Pennsylvania and school is almost over for the year.

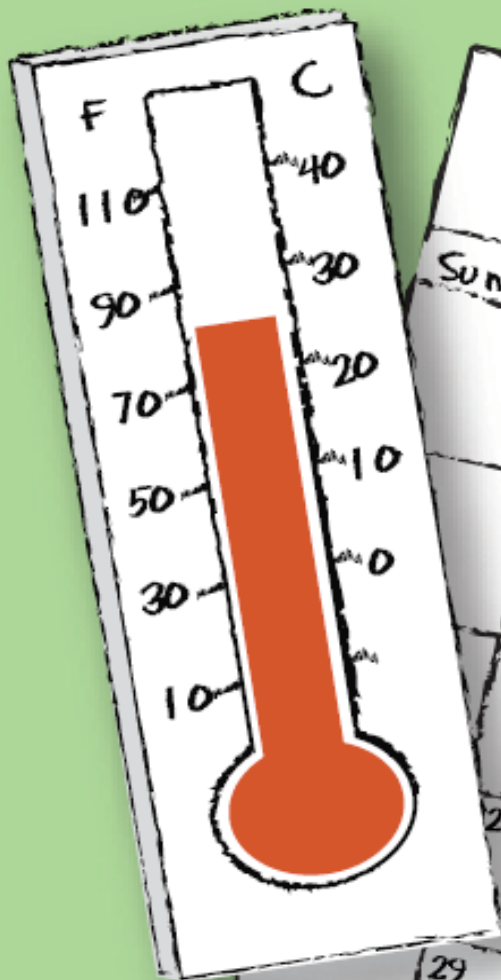
The thermometer on the left shows the current temperature as 25 degrees Celsius. On your datasheet, color the February thermometer to 25 degrees.

30 is hot

20 is nice

10 is chilly

0 is ice



June

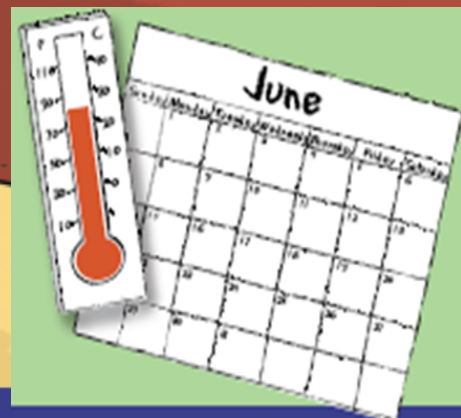
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
8	9	10	11	12	13	
15	16	17	18	19	20	
22	23	24	25	26	27	
29	30	31				

Summer vacation was about to begin and the students were busy packing up their supplies.

“Our classroom is too hot,” complained Simon as he opened a window. Anita glanced out the window because something caught her eye. She stopped what she was doing.

Dennis called out, “Anita, are you still looking for the hummingbirds? You know they are out there and you will have all summer to watch them.”

Anita turned around with a sparkle in her eye. “No, it’s something new this time. I just noticed a long white line trailing behind a jet plane in the sky. I wonder what that is....”



Simon put his hand on top of his head and said, “Oh no, here she goes again. Anita, we are going to have to wait until we get together again next school year to answer that question!”

Ms. Patel smiled and said, “That’s for sure and it’s a good thing Anita is so observant because we will never run out of things to investigate.”



June

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Elementary GLOBE