## WHAT IS THE VALUE OF YOUR CITIZENSHIP?

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Session 1

Reader’s Theater

What is the value of your citizenship?

Setting: It’s day four at One World Camp in Seattle, Washington. High school students from around the world apply to come here to learn about conflict resolution. The students are assigned to different groups of four with the goal of getting to know each other. Funda is from Germany; Antoine is from the United States; Quique is from Bolivia; and Ari is from Israel. Antoine looked at the questions they were supposed to talk about, and thought he might have the most boring conversation of his life. “Question #1: What country are you from, and what does it take to be a citizen in that country?” Much to Antoine’s surprise, 15 minutes later they were still discussing the first question.

Funda: But Antoine, you have it so easy in this country. You’re born in the United States and—ta dah!—you’re a U.S. citizen. I was born in Germany and have lived there my whole life, but I’m still not considered German because my parents are Turkish.

Ari: How can that be? I thought people were automatically citizens of the country they were born in.

Funda: Not necessarily. Germany did change its law, so if you’re born in Germany after January 1, 2000, you’re automatically a citizen. But I was born in 1999, so that law doesn’t apply to me. Besides, you should know better—lots of people born in Israel don’t have citizenship rights there. Immigrants’ children are automatically citizens only if they are Jewish.

Ari: I guess that’s true. And I do get to be a citizen even though I wasn’t born in Israel because my parents are Jewish.

Funda: So you and I are in reverse situations. I am not an automatic German citizen, despite being born there, because my parents are Turkish. You are an automatic Israeli citizen, despite not being born there, because your parents are Jewish.

Antoine: Gosh, that’s crazy. There are so many different qualifications for citizenship. I guess we are lucky in the States that citizenship is not influenced by race or religion.

Quique: Hold on there, Tony. It wasn’t until after the Civil War that blacks could be U.S. citizens, and the Native Americans weren’t able to become U.S. citizens until 1924.

Antoine: That’s a good point, Quique. But you know I hate being called “Tony.”

Quique: Sorry, Antoine, won’t do it again. But people keep forgetting about citizenship rights for indigenous groups. We have had to fight hard for fair treatment as indigenous Bolivians. Officially we have equal rights as citizens; that is, all the official documents say so. But indigenous peoples have always been treated like second-class citizens. For example, we used to get pressured to change our names to sound more European if we wanted to get into university. In a sense, we had to renounce our native identity, like cutting off our braids, wearing European clothes, and speaking only Spanish. We’re citizens, but there’s a lot of discrimination against us.

Funda: But Evo Morales was elected president, and he’s indigenous, isn’t he?

Quique: That’s right. We’ve broken some barriers, just like in the U.S. when President Obama was elected. But discrimination doesn’t just disappear. It takes a lot of work to ensure that everyone has access to civil rights as well as human rights.

Antoine: You’ve lost me again. What’s the difference?

Quique: Human rights define what everyone can expect, but civil rights are associated with citizenship. That’s why it’s so important to know who can be a citizen where, and not just take citizenship for granted like you do, Antoine.

Funda: Well I don’t take it for granted, and neither do my friends in Germany. We are kind of obsessed with citizenship. Maybe it’s because Turks in Germany feel like they have too little agency.

Antoine: What? What do you need agencies for?

Funda: Not agencies. Agency. It means you can actually do something about your situation. You can’t have agency if you don’t have any rights.

Antoine: This is all really enlightening. Now I see why my dad is so proud to be an American citizen. He came here from Kenya for university, and then he had to go through some big deal to become a citizen when he decided to stay. He had met my mother by then, and they had to prove they didn’t just get married to get him legal documents. Some people actually do that. They try to find someone to marry them so they can stay in the U.S., but never actually plan to stay married. My dad had a student visa first, then got a work visa and temporary resident permit, then he got a green card, and then three years after that, he finally got citizenship. He says it’s called naturalization.

continued on the next page
QUIQUE: Naturalization? So that’s when a foreign-born person can get citizenship after spending a certain amount of time in a country, and then swearing allegiance to the new nation, right? Did your father have to renounce his Kenyan citizenship to become a U.S. citizen? Some countries allow dual citizenship.

ANTOINE: I think he has dual citizenship. But why would it matter? He’s really American now.

FUNDA: My brother was born in March 2000, so he is a German citizen. But he has to renounce any legal ties with Turkey by the time he is 23, or he automatically loses his German citizenship! If he forgets to fill out the document, then the day after his twenty-third birthday he’ll no longer be a German citizen.

ANTOINE: It’s kind of mean to take away your citizenship because you forgot to fill out a document. But I don’t think it’s crazy to require someone to renounce their old citizenship before you allow them to become a citizen of another country. What if the countries went to war? You have to know where a person’s allegiance lies.

ANTOINE: Citizenship is not as simple as people think. I just remembered my best friend in third grade, Gilberto. He disappeared one day without notice. It turned out that he and his parents had overstayed their visas, and they were deported, just like that. Gilberto had lived in Chicago since he was a baby. He didn’t even speak Spanish, but boom, citizenship issues took him away from everything he knew. It’s sad, but I realize now that human rights and civil rights are not always the same.

QUIQUE: If you feel that way I guess you should join the fight for immigration reform! Take some—what-do-you-call-it?—agency!

FUNDA: I love talking to you guys, but other matters are more important right now. I’m starving. Let’s resolve to continue this discussion over lunch.

TURN AND TALK

What do you think it means to be a citizen?
**PATHWAYS TO U.S. CITIZENSHIP**
(for those not born in the United States)

One parent is a citizen of the United States.

Neither parent is a U.S. citizen, but close family members are naturalized citizens.

No relatives live in the U.S., but your country of residence is a dangerous place.

You marry a citizen or serve in the U.S. Armed Forces.

**Automatically disqualified:**
- Felons
- TERRORISTS
- COMMUNISTS
- PEOPLE ENGAGED IN VICE
- PEOPLE WITH CERTAIN DISEASES
- PEOPLE WITHOUT SUFFICIENT FUNDS

**CITIZENSHIP TEST REQUIRED**

Sample questions:
- What is the name of the U.S. vice president now?
- In what month do we vote for president?
- How many justices are there on the Supreme Court?
- What is an Amendment?
- What happened at the Constitutional Convention?
- What is the “rule of law”?
- When must all men register for the selective service?

**Apply for a resident visa**

Apply for refugee status

Five years of residency

Five years of residency

Three years of residency

**CITIZENSHIP**
Discuss what it means to be a citizen of a country.

_A citizen is someone who___________________________._

Next, read about Ozan, Ana, and Aizhana. Though these three biographies are fictionalized, they are based on real cases of individuals born in Germany, the U.S., and Kazakhstan, and those individuals’ stories about citizenship.

**Ozan: The Story of a German Turk**

*My name is Ozan and I live in Ankara, which is the capital of Turkey, but I haven’t always lived here. In 1978, I was born in Essen, Germany, to Turkish parents who had gone there to work at the Krupps factory. But because my parents were Turkish, German law prohibited granting me citizenship. I spent my whole life in Essen and have always considered myself a **dual** national—both German and Turkish. I speak both languages, though I read and write better in German. In my early 20s, the German government forced me to decide if I wanted to **renounce** my Turkish citizenship for full German citizenship. I hesitated a long time, but I finally **resolved** to return to Turkey. At first this was very difficult because I had to leave my family, my friends, and the culture I had grown up in to go to a place I had only visited on vacation. Germany was orderly, and everything in Turkey seemed chaotic, although much friendlier. The good news is that the Turkish economy is growing, and there are many opportunities for artists like me. In Germany, I was always reminded that I was Turkish, and in Turkey, I often feel German or like an outsider. It’s difficult to feel allegiance to both countries when **dual** citizenship is not allowed. I imagine many German Turks will probably never fully **resolve** their issues around identity.*

**Historical Background: Children Born to Turkish Families in Germany**

During the 1960s, many Turkish people traveled to Germany to work because the pay was much better than in their home country. And many of the Turks stayed and settled in German cities and had children. Germany did not guarantee citizenship based on birth. The German government considered children born to Turkish families on German soil to be legal residents but not citizens. These children grew up in Germany, attended German schools, and spoke the German language as well as their classmates from German-speaking homes, but they did not have the **rights** of citizenship. Then in 2000, the German government implemented a new citizenship law. German Turks could gain German citizenship by **renouncing** their citizenship in Turkey. So today, German Turks have to choose either German or Turkish citizenship by age 23. This new citizenship law has left many German Turks torn between **dual** national identities.

**TURN AND TALK**

Inge was born in Poland, where her German parents lived for many years. As you know, Ozan was born in Germany. Inge is a German citizen, but Ozan is not. Explain how this could happen.

Is this fair? Why or why not?
Ana: The Story of a U.S. Citizen with Honduran Parents

My name is Ana. I live in Montgomery, Alabama, and I’m in the eighth grade. My parents came to the United States from San Pedro Sula, Honduras, in 2000 to escape the violence there. They came with temporary work visas, but when their visas expired, they decided that it would be too dangerous to return. There was a terrible drug war going on, and they were worried that my older brother might get hurt. I was born here soon after they arrived and have lived in this city my whole life.

Sometimes kids at school say that a person cannot be a real American if their parents are undocumented. They say that people like me have to apply for citizenship like any other immigrant. I don’t think U.S.-born students understand what their own country says about who can be a citizen. I am a citizen because I was born here!

My brother Tito, though, is not a citizen. He started school here in fourth grade and was always the best student in his class. When he was chosen valedictorian of his graduating class, my parents were very proud but also worried. They thought if his picture appeared in the paper, people might start asking about his immigration status! And he couldn’t attend Alabama State University because it was too expensive, and undocumented immigrants don’t get resident tuition. My parents work hard, pay taxes, go to PTA meetings, and volunteer at the local homeless shelter. They might be undocumented, but they are civic-minded and love this country and uphold its values—maybe even more than some American citizens who take their country for granted.

Historical Background: U.S. Citizenship by Various Means

In 1868, the United States passed the 14th Amendment to the Constitution, which states that if a person is born in the United States, he or she is entitled to U.S. citizenship. Individuals can also be U.S. citizens if they are born in another country but have at least one parent who is an American citizen or if they go through a process called “naturalization.” Naturalization allows people who were not born in the United States to become citizens if they live here for a certain period of time, learn English, and stay out of legal trouble.

TURN AND TALK

Dolores (on the left) was born in New Mexico. Her ancestors were Native Americans and lived in that area for centuries. Her great grandparents were born in the U.S., but they were not considered citizens because they were Native Americans. You read above that Ana (on the right) was born in Alabama. Her parents are from Honduras, and they do not have U.S. citizenship. Explain how both Dolores and Ana are U.S. citizens.

Is it fair that Ana is a U.S. citizen and her brother Tito is not?
Aizhana: The Story of a Young Woman Made Stateless by History

My name is Aizhana, and I was born in Kazakhstan when it was still part of the Union of Soviet Socialist Republics (USSR). I left Kazakhstan when I was 15 because I wanted to be a violinist, and my teachers suggested I would get better training in Russia. In 1991, though, the Soviet Union broke up. I was in Russia as a student, and would have needed to go back to Kazakhstan to get a new passport with Kazakh citizenship. But I didn’t want to abandon my studies just to go get new documents proving my Kazakh nationality. So I postponed the trip, not realizing what the consequences would be.

My violin studies were going really well, and I started to get invited to give concerts all over. That’s when I realized how difficult life could be without a passport! So I compiled my documents – birth certificate, proof of residency in Russia, testimony to my good character – and applied for Russian citizenship in 2003. But the documents keep being sent from agency to agency and no one in charge will process them, so there is still no resolution to my case.

I do have a “travel document for the stateless.” That works sometimes to get me across borders, but sometimes I just get sent back to Moscow after having flown to another country because the border guards don’t recognize it as a valid document. At one point I hoped for an international career as a violin soloist, but because I am stateless it is very hard for me to commit to foreign contracts. So now I mostly just play concerts in Russia and teach violin.

Historical Background: Statelessness After the Breakup of the USSR

The USSR was first created in 1922 and comprised a single government, which eventually expanded to cover the territory of 15 separate nations. Of the Soviet Republics, Russia was the largest, richest, and most dominant politically. It was also the site of the best universities and research centers. So many people from Azerbaijan, Belarus, Kazakhstan, Tajikistan, and the other republics moved to Russia for a good education and a chance to improve the quality of their lives.

After the USSR broke up, there was a period of political and economic instability in the former Soviet Republics, including Russia itself. Under the Soviet system, the government had provided jobs, housing, pensions, and the necessities of life. Moving to an open-market system and rebuilding the governmental structures needed to sort out nationality, residency, and citizenship has left many residents of former Soviet republics stateless.

Most statelessness, though, is the result of wars and famines. When people become refugees, they may have to flee across borders, often with no documents proving citizenship or showing their birthplace. The United Nations estimates there are 12 million stateless people in the world.
The 14th Amendment to the U.S. Constitution reads: “All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the States wherein they reside.”

Why do countries bother to identify a special class of people called “citizens”? Does it matter if you are a citizen or not? Why can’t we just live anywhere we want, travel anywhere we want, and work anywhere we want, without worrying about proving we are members of a particular class?

Garry Davis was a World War II bomber pilot turned peace activist. He resolved to renounce his American citizenship because he thought citizenship promoted nationalism, and nationalism led to wars. He thought the world would be a simpler place with universal world citizenship. Anyone who has moved from one country to another has encountered evidence that official status matters. Official status in the United States might come from being a citizen, having a green card, or having a valid visa. However, it has been estimated that about 11 million residents in the United States have no official status; they are “undocumented” either because they crossed the border without registering or because they overstayed time-limited visas.

What are the differences between being a citizen (or an immigrant with official status) and an undocumented immigrant?

The Bill of Rights and federal and state laws apply to immigrants as much as to citizens. Political pressure has limited the extension of many rights, such as welfare benefits, to undocumented immigrants—even those who pay taxes. Let’s look at some additional distinctions between citizens and non-citizens.

<table>
<thead>
<tr>
<th>Citizens, legal immigrants, and undocumented immigrants can:</th>
<th>Citizens and legal immigrants can do all of the above, plus:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• enroll in public schools.</td>
<td>• access social services, such as pensions, welfare, Medicaid, and Medicare.</td>
</tr>
<tr>
<td>• expect the protection of the police and the courts.</td>
<td>• get jobs without work permits.</td>
</tr>
<tr>
<td>• access emergency medical care in hospitals and clinics.</td>
<td>• get driver’s licenses.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Citizens can do all of the above, plus:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• vote in local elections (in some states).</td>
<td>• get U.S. passports.</td>
</tr>
<tr>
<td></td>
<td>• vote in state and federal elections.</td>
</tr>
<tr>
<td></td>
<td>• run for public office.</td>
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</tbody>
</table>

TURN AND TALK

What is the most important right, in your opinion, that citizens have and undocumented immigrants don’t have?
State colleges and universities are supported by taxes, and the state residents who pay those taxes get the benefit of lower tuition rates. Out-of-state residents might pay two to three times as much for the same education (see table below). The question is, who qualifies to pay the lower in-state resident rate? Some states have passed laws stating that only legally documented residents qualify. In other words, students who have lived in those states for years, even those who have gone to public schools there, do not have the right to the lower tuition rates that other state residents have. However, more than 15 states have resolved to extend this right to undocumented immigrant residents, with the argument that a well-educated work force is better for everyone.

<table>
<thead>
<tr>
<th>Resident undergraduate tuition and fees per semester</th>
<th>Nonresident undergraduate tuition and fees per semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Texas, Austin $4,908</td>
<td>$17,430</td>
</tr>
<tr>
<td>Arizona State University, Tempe $5,239</td>
<td>$12,729</td>
</tr>
<tr>
<td>Eastern Arizona College $1,040</td>
<td>$4,790</td>
</tr>
<tr>
<td>Ohio State $5,018</td>
<td>$13,682</td>
</tr>
<tr>
<td>Ohio University $5,774</td>
<td>$10,256</td>
</tr>
<tr>
<td>University of Massachusetts, Amherst $7,035</td>
<td>$15,252</td>
</tr>
<tr>
<td>University of Massachusetts, Dartmouth $6,294</td>
<td>$13,086</td>
</tr>
</tbody>
</table>

TURN AND TALK

Mark on the line how much you agree or disagree with the statement below. Then talk with your partner about why you chose your position on the continuum.

Everybody should have access to a government-supported college education, regardless of citizenship status.

AGREE                          DISAGREE
Some would argue that working and earning money is a human right. In 1884, the U.S. Supreme Court declared it a constitutional right as well, stating, “The right to follow any of the common occupations of life is an inalienable right ... under the phrase ‘pursuit of happiness.’” Senators and members of the House of Representatives have considered a bill that would provide every U.S. resident with a special “worker ID card,” with biometric information embedded. Then a federal agency could use the information on the card to verify a person’s status as a citizen or legal alien. Since undocumented immigrants could not get a card, they would not be able to work. While the worker ID would keep undocumented immigrants from taking jobs, it would also pressure everyone into getting the card. Many people think the need for a worker ID containing their biometric information would be an encroachment on their rights.

TURN AND TALK

Mark on the line how much you agree or disagree with the statement below. Then talk with your partner about why you chose your position on the continuum.

Everyone should have access to gainful employment, regardless of citizenship status.

AGREE


DISAGREE

TURN, TALK, AND WRITE

After discussing with your partner, use the chart below to take some notes about the advantages and costs of treating citizens and non-citizens differently from the government’s point of view and from society’s point of view.

<table>
<thead>
<tr>
<th></th>
<th>advantages</th>
<th>costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>government</td>
<td></td>
<td></td>
</tr>
<tr>
<td>society</td>
<td></td>
<td></td>
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</tbody>
</table>
Below is an excerpt of a famous poem by Emma Lazarus that is engraved on the pedestal of the Statue of Liberty:

*The New Colossus*

Give me your tired, your poor,
Your huddled masses yearning to breathe free,
The wretched refuse of your teeming shore.
Send these, the homeless, tempest-tost to me,
I lift my lamp beside the golden door!

This poem was written in 1883, at a time when the United States welcomed immigrants and it was much easier for immigrants to become citizens.

While the beauty of the poem is universally appreciated, many now say it offers a romantic and unrealistic vision because the pressure associated with accepting unlimited numbers of immigrants and their children is too great. They would argue that we should devise policies to bring in educated and economically productive immigrants, not “your tired, your poor, your huddled masses.”

Others counter that the U.S. immigration policy of welcoming refugees has been very successful, and that many who arrive “tired and poor” go on to receive an education and build businesses. They also argue that birthright citizenship is a basic American principle. Many argue that we should figure out how to make it even easier for immigrants to become full-fledged American citizens.

**TURN AND TALK**

Do you have any ancestors that came to the United States looking to build a new life?
**Session 4**

**It’s Debate Time!**

**Directions:** Working with a partner, use the information from the unit to fill in arguments for and against the statement below. Make sure to go back through the unit to find evidence and examples to support your side. Then be prepared to participate in a whole-class debate on this issue.

The pathway to American citizenship for immigrants should be made easier.

<table>
<thead>
<tr>
<th>Make getting citizenship easier</th>
<th>Make getting citizenship harder</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arguments</strong></td>
<td><strong>Arguments</strong></td>
</tr>
<tr>
<td><em>pro</em></td>
<td><em>con</em></td>
</tr>
</tbody>
</table>
Throughout the world, countries differ in the laws governing citizenship rights at birth.

- Anyone born in Mexico, Brazil, or Fiji has an automatic right to citizenship in those countries, but being born in China, the Netherlands, and Iran does not give automatic citizenship rights.
- In most countries, even if you are born there, you must have a parent who is a citizen of that country in order to receive citizenship at birth.
- The United States and Canada are the only developed nations left who offer immediate birthright citizenship.

Should the United States continue to give citizenship as a right of birth, or should it join the majority of developed countries in requiring that at least one parent be a citizen? In addition to providing arguments that support your position, address at least one counterargument.
Garry Davis (1921–2013) had been a Broadway actor before he became a U.S. bomber pilot in World War II. At the age of 26, while in Paris, France, Davis renounced his exclusive citizenship in—and allegiance to—the United States of America. Davis was disturbed by the devastation he saw during WWII. He thought the best way to prevent another war would be the establishment of a single, universal government. He created the International Registry of World Citizens in 1949 to build support for the idea and to create pressure for change. Over 750,000 individuals signed up for this registry. Davis received support from famous individuals, including Albert Einstein, who said:

“Mark my words, this boy, Garry Davis has grasped the only problem that deserves the devotion of contemporary man, the problem to which I myself am determined to devote the rest of my life, up to the very last day ... the survival of the species. It is a question of knowing whether mankind - the very universe of man - will disappear by its own hand, or whether it will continue to exist.” Source: http://www.kgraradio.com/portfolio-view/world-citizen-radio/

Today, individuals can still register to be world citizens and obtain a world passport. The world passport serves as a travel document for individuals who choose not to express allegiance to a single nation. Of course, those who travel and use the world passport may have a difficult time entering some countries. Garry Davis himself was put in prison many times for traveling without widely recognized documents. Nonetheless he persisted in using his world passport, and traveled all over the world with it, meeting many world leaders in the process. Currently six countries in the world legally recognize the world passport, and 180 countries have accepted it at some point in their history.

The world passport represents a renunciation of the notion that citizenship in a country defines human beings. Garry Davis was fighting for the idea that we are all members of a universal community, and that we should take agency and resolve to reject restrictions on our rights to visit or live wherever we want.

DISCUSSION QUESTIONS

Why did Garry Davis think a world government would be an improvement over the situation of many different national governments? Do you agree?

How could the creation of a world government be linked to the survival of humans, as Einstein suggests?

Would you be willing to give up citizenship in your country to support Garry Davis’ campaign for universal citizenship?
Iris Scans and Scientific Notation

Millions of people cross international borders each year for business, travel, or safety. Government agencies require that individuals entering their countries provide identity documentation as a measure to ensure security and safety. As a result, immigration agencies at points of entry, such as airports, often struggle to process travelers in a timely way while taking the appropriate security measures like verifying traveler identities, interviewing travelers, and searching belongings.

As a response to these pressures, some countries use programs that allow certain low-risk and pre-approved travelers to skip some of the security hurdles required of other passengers. One such program operates in Canada and the United States. To verify passengers’ identities, the program uses iris scans. As you probably know, irises come in different colors, ranging from brown to grey to blue to green. What you may not know is that when analyzed on a microscopic level, an iris actually contains unique and complex mathematical patterns, which can be used to confirm a person’s identity. Iris scans have the dual benefit of being quick (they take only a fraction of a second) and extremely accurate. This technology has become so popular that many schools are adopting it. One district plans to scan student irises as they enter school buses so that information about the students’ whereabouts can be instantly sent to parents on their mobile devices.

Images can be taken using many different kinds of waves. Most iris scans use waves from the visible light range. X-rays allow dentists to see cavities and radiologists to see bone fractures. Infrared rays create heat images that can detect the presence of warm-blooded animals. Wave ranges are distinguished by their wavelengths. A wavelength is defined as the distance between two adjacent high points on a wave. Scientists often use scientific notation to describe wavelengths, since they can be incredibly small or relatively large.

The universal format for scientific notation is: \(a \times 10^b\). Follow these steps to write a number in scientific notation. The following example shows how to write 0.0000045 in scientific notation:

1. Find the coefficient (a): Move the decimal point so that it is between the digit in the largest place value position and second largest place value position.

   \[0.0000045 \rightarrow 0000004.5 \rightarrow 4.5\]

2. Find the exponent (b): Count the number of positions that you moved the decimal. This number is the exponent. When the decimal is moved to the left, the exponent is positive. When the decimal is moved to the right, the exponent is negative.

   \[0.0000045 \rightarrow -6\]

3. Multiply the coefficient by 10 raised to the exponent you found in step 2: \(4.5 \times 10^{-6}\)

Fill in the following chart using what you have learned about scientific notation. Note that each type of wave can have many wavelengths, and we have selected one.

<table>
<thead>
<tr>
<th>wave range</th>
<th>standard notation</th>
<th>scientific notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-ray</td>
<td>0.000000001 m</td>
<td></td>
</tr>
<tr>
<td>visible light</td>
<td>2 x 10^{-6} m</td>
<td></td>
</tr>
<tr>
<td>infrared</td>
<td>0.00004 m</td>
<td></td>
</tr>
<tr>
<td>micro</td>
<td>8 x 10^{-1} m</td>
<td></td>
</tr>
<tr>
<td>radio</td>
<td>10 m</td>
<td></td>
</tr>
</tbody>
</table>
Iris Scans and Scientific Notation

Now use both standard and scientific notation to compare the wavelengths of different waves. Compare the standard notation lengths by using division. Compare the scientific notation lengths by looking at the exponents.

1. How many times larger is an infrared wave than an x-ray? Use scientific notation.

2. How many times larger is a microwave than a visible light wave? Use standard notation.

TURN AND TALK

Why do you think mathematicians prefer using scientific notation to standard notation when dealing with extremely large and small numbers?
The Science of Documenting Citizenship

Biometrics is the identification of human beings by their unique physical traits. Since every person has different fingerprints, irises, faces, and DNA, science can document who is who beyond a shadow of a doubt by marking key physical identifiers. Often you see on TV and in the movies secret agents having to activate machines or doors with their eyes or through voice recognition. Although the shows are fictional, the technology is real.

All U.S. passports issued after August 2007 contain biometric chips, which store facial recognition software allowing for extra security against fraud. Avoiding fraud and corruption seem to be the most obvious reasons to document who is who.

In India, biometrics serve a different purpose. In 2010, the Unique Identification (UID) project, also called Aadhaar, was launched. The objective of the project is to biometrically identify every person over the age of five. The government is collecting scans of both irises and all 10 fingerprints of its citizens. It then uses this biometric information to create identity cards for citizens. These identity cards help the government recognize each citizen, and they also provide citizens with access to certain rights.

Offering biometric information and participating in the identity card program is voluntary, and many people in India want to participate in the program. In contrast to the United States, many citizens in India do not receive birth certificates. Consequently, they have no form of formal identification. The identity cards, however, provide them with formal identification documentation. Sometimes after people receive their identity cards they even frame them on their walls. In other countries like England, when the discussion of a national identity card arose the public saw it as an invasion of privacy and rejected the idea.

The Science of Fingerprints

The tips of human fingers and toes have friction ridges, which are small extensions of the skin. Friction ridges not only help us grip the things that we pick up, but they leave behind marks on the items we handle. These marks are called “fingerprints.” Because each person has a different friction ridge pattern on his or her fingers, each individual’s fingerprints are unique. This uniqueness means that fingerprints can be a useful source of biometric identification.

While fingerprints are unique, they do follow some basic patterns. You can see eight different patterns below.

**Determine the pattern of your fingerprints:**

1. Rub a pencil on paper until you have a dark (graphite) spot the size of your fingertip.
2. Rub your finger over this spot so your fingertip is covered with graphite.
3. Lay a piece of cellophane tape over your graphite-covered fingertip.
4. Remove the tape and stick it on a piece of white paper.
5. Examine your fingerprint left on the tape and compare it to the basic fingerprint patterns in the pictures to determine your fingerprint’s pattern.

**DISCUSSION QUESTIONS**

1. Why can fingerprints be used for biometric identification?
2. How can fingerprints be used to help citizens access their rights?
3. How do you feel about government efforts to use biometric information to identify citizens? Explain.
### Focus Words

**agency (noun)**
- **Definition**: The ability to take action or use power; an organization that provides a service.
- **Sample Sentence**: George demonstrated his personal agency by refusing to go along with the students picking on Sam.
- **Turn and Talk**: How do you exercise personal agency in your day-to-day life?

**pressure (verb, noun)**
- **Definition**: (v) to try to convince or force someone to do something; (n) a continued force exerted against something.
- **Sample Sentence**: Advertisements often pressure teens to buy expensive brands.
- **Turn and Talk**: Have you ever watched a friend pressure someone to do the right thing even when it wasn’t “cool”?

**document (noun, verb)**
- **Definition**: (n) an official paper; (v) to record something by writing it down or capturing it electronically.
- **Sample Sentence**: A founding document of the United States is the U.S. Constitution.
- **Turn and Talk**: Identify a document that is important to your family. If you are going to complain about the quality of a product, why might it be helpful to document your problems?

**resolve (verb)**
- **Definition**: To commit or decide firmly; to solve a problem or dispute.
- **Sample Sentence**: Seymour resolved to keep his room cleaner, which resolved the conflict with his mother.
- **Turn and Talk**: What self-improvement strategy have you resolved to adopt?

**dual (adjective)**
- **Definition**: Relating to two; having two parts.
- **Sample Sentence**: Many countries do not allow dual citizenship.
- **Turn and Talk**: What are some technologies that have dual purposes?

**renounce (verb)**
- **Definition**: To formally give up; to declare that one will no longer support something.
- **Sample Sentence**: Immigrants who are dissatisfied with the situation in their home countries often renounce their citizenship.
- **Turn and Talk**: Should citizens of a country ever renounce their citizenship? Why or why not?

**universal (adjective)**
- **Definition**: Everywhere; for everyone.
- **Sample Sentence**: Quinn’s honesty and reliability earned him universal respect.
- **Turn and Talk**: Can you think of a universal need humans have other than water?

**right (noun)**
- **Definition**: Something that someone is legally or morally entitled to.
- **Sample Sentence**: In the United States, all students under the age of 16 have the right to a free education.
- **Turn and Talk**: Should citizens under the age of 18 have the right to vote?