

REAL-WORLD TAKEAWAYS

- Different professions can earn vastly different incomes. The disparities can be so large as to seem unfair.
- There's a difference between how much a person earns and how much value they create. Some professions that don't command high salaries still yield tremendous value.
- The salary someone earns often has to do with the relationship between the payer and payee. When the person (or organization) who pays the salary also reaps the value that the worker creates, they can justify paying a high salary. When the person who pays the salary is different than the person/organization who reaps the value, they may not be incentivized to pay what the job is "worth."

MATHEMATICAL OBJECTIVES

- Calculate unit rates, including income per month, week, day, hour, and minute
- Make comparisons between unit rates
- Use ratio and rate reasoning to solve real-world problems

LESSON AT A GLANCE

80 MIN.

LAUNCH		Watch a 2018 video of LeBron James arriving in Los Angeles to negotiate with the Los Angeles Lakers about joining their team. Discuss how much his contract was for and why the Lakers agreed to pay him such a large amount of money.	5 min.
PART ONE	1	Use the annual salaries of a top-paid teacher and LeBron James to calculate how much each person earns per day.	20 min.
	2	Calculate how much each profession earns per different unit of time (e.g. per week, hour, minute, etc.). Come up with an interesting way to compare the two unit rates, e.g. "It takes a teacher x days to earn what LeBron James earns in one hour."	20 min.
PART TWO	3	Discuss the difference between a profession's <i>income</i> and its <i>value</i> . Given estimates for the annual values of an excellent teacher and LeBron James, use various strategies to calculate which profession is more valuable compared to its annual salary.	25 min.
	4	Discuss why athletes earn so much more than teachers and whether this is likely to change.	10 min.

L Students watch a video showing a private airplane landing at an airport. The passenger exits the plane and is driven by SUV to a large mansion. At first glance, it isn't clear where the plane is landing, who the mystery passenger is, or where he's going.

Upon closer inspection, we see that the passenger is LeBron James and the location is Los Angeles. The video is from 2018, the year of LeBron James's free agency. The video shows LeBron arriving in Los Angeles and being driven to what is presumably the home of the owner of the Lakers to negotiate his joining the team...including his 4-year, \$154 million dollar salary.

DISCUSSIONS QUESTION

1. Can you tell where the plane is landing? Can you tell who the passenger is?
2. The video is from 2018, the year of LeBron James's free agency. Who do you think he was meeting with?
3. Do you know how much the Lakers paid LeBron to join their team?
4. Why do you think they paid him this much?

KEY TAKEAWAYS

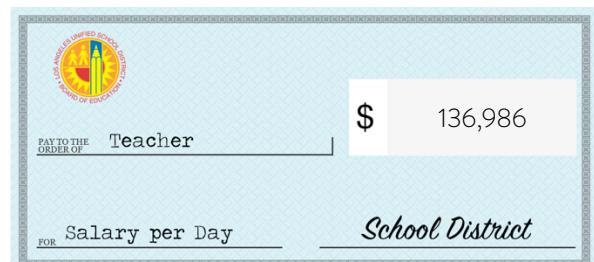
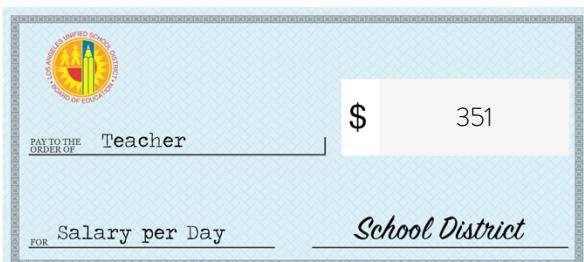
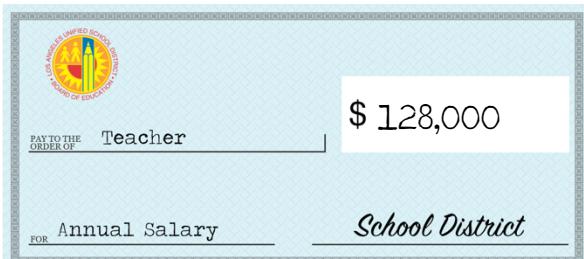
- In 2018, LeBron James joined the Los Angeles Lakers.
- To recruit the star player, the Lakers had to pay LeBron a lot of money. His 4-year contract was worth \$154 million.
- Even though \$150 million is a lot of money to pay a single player, the Lakers probably reasoned that they would earn even more by having LeBron on their team.

TEACHING TIP

A four-year contract for \$154 million implies an annual salary of \$38.5 million. However, the annual salary the lesson uses for LeBron James is \$50 million. After LeBron's initial 4-year contract was up, he decided to stay with the team at an even higher annual salary.

1 Even when someone is top-notch at their job, how much they earn depends on what job they do. In Los Angeles, the highest-paid teacher earns \$128,000 per year. Meanwhile, Lakers star LeBron James earns roughly \$50 million (not including endorsements).

Calculate how much a teacher and LeBron James each earns for every day of the year. Is this more or less than you'd expect?



1 year = 365 days

$$\frac{\$128,000}{365 \text{ days}} = \$351 \text{ per day}$$

1 year = 365 days

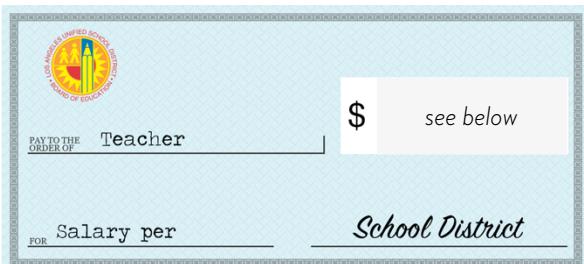
$$\frac{\$50,000,000}{365 \text{ days}} = \$136,986 \text{ per day}$$

Students' responses will vary about whether the daily amounts are surprising or not.

TEACHING TIP

Students may protest that since people don't work for all 365 days of the year, they should calculate the amount earned per day worked rather than the amount earned per day. If so, bravo to them; that's a good point! Still, the lesson treats all days equally. The reason is that since salaries are paid annually, people effectively *are* paid per day. After all, if a teacher misses a day of work because they're sick, or if LeBron misses a game because he's injured, their salaries aren't docked for the time they missed.

2 Now pick a different unit of time – e.g. a month, week, hour, minute, or second – and calculate how much each person earns. Once you've done this, come up with the most interesting way you can to compare the two incomes. (For instance, "LeBron earns in one minute what a teacher earns in x days" or something like that.)



Units of Time in a Year					
Months	Weeks	Days	Hours	Minutes	Seconds
12	52	365	$365 \cdot 24 = 8,760$	$8,760 \cdot 60 = 525,600$	$525,600 \cdot 60 = 31,536,000$

$$\frac{\$128,000}{12 \text{ months}} = \$10,667 \text{ per month}$$

$$\frac{\$50,000,000}{12 \text{ months}} = \$4,166,667 \text{ per month}$$

$$\frac{\$128,000}{52 \text{ weeks}} = \$2,462 \text{ per week}$$

$$\frac{\$50,000,000}{52 \text{ weeks}} = \$961,538 \text{ per week}$$

$$\frac{\$128,000}{365 \text{ days}} = \$351 \text{ per day}$$

$$\frac{\$50,000,000}{365 \text{ days}} = \$136,986 \text{ per day}$$

$$\frac{\$128,000}{8,760 \text{ hours}} = \$14.61 \text{ per hour}$$

$$\frac{\$50,000,000}{8,760 \text{ hours}} = \$5,707 \text{ per hour}$$

$$\frac{\$128,000}{525,600 \text{ minutes}} = \$0.24 \text{ per minute}$$

$$\frac{\$50,000,000}{525,600 \text{ minutes}} = \$95.13 \text{ per minute}$$

$$\frac{\$128,000}{31,536,000 \text{ seconds}} = \$0.004 \text{ per second}$$

$$\frac{\$50,000,000}{31,536,000 \text{ seconds}} = \$1.59 \text{ per second}$$

Salary comparisons will vary. Possible responses include:

- It would take a teacher almost 400 years to earn LeBron James's annual salary. ($\$50,000,000 \div \$128,000 = 390.6$)
- LeBron earns more in one day more than a teacher earns in one year. ($\$136,986 > \$128,000$)
- It takes a teacher more than two weeks to earn what LeBron James does in an hour. ($\$5,707 \div \$2,462 = 2.3$)
- Depending on the features, a Rolls-Royce Ghost costs around \$400,000. It would take LeBron around three days to afford that. ($\$400,000 \div \$136,986 = 2.9$). It would take a teacher more than three years. ($\$400,000 \div \$128,000 = 3.1$)

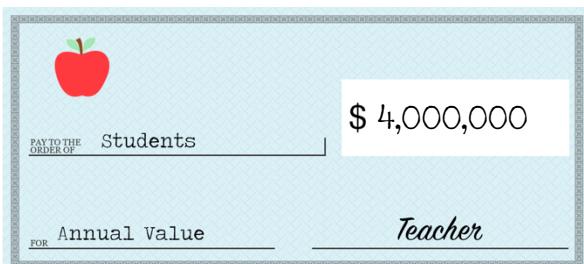
TEACHING TIP

The sample calculations all use the annual salary as the base. However, students may calculate the per-unit-of-time rates differently. For instance, to find out how much LeBron earns per hour, instead of dividing \$50,000,000 by 8,760 (annual income \div hours in a year), students might divide \$136,986 by 24 (daily income \div hours in a day). This is fine. In this case, the values students calculate may be slightly different due to rounding.

Note: Even if students use the previous rate to find the new rate (e.g. week \rightarrow day, day \rightarrow hour, etc.), they must be careful about how they calculate the per-week value. If students divide the monthly rate by 4, they'll get an incorrect answer since most months contain more than four weeks. To ensure an accurate per-week value, students should divide the annual salary by 52.

3 There's a difference between how much someone earns and how much value they create. In sports, an all-star athlete can draw fans to games, increase merchandise sales, and boost television revenue. In education, an analysis by an economist at Stanford University found that an all-star teacher can increase the lifetime earnings of a year's worth of students by almost \$4 million.

Let's assume that the Lakers earn an additional \$75 million each year by having LeBron James on the team, and that the top-paid teacher in Los Angeles increases students' lifetime earnings by \$4 million. Compared to their annual salaries, which job would you say is more valuable? Explain.



METHOD 1: CALCULATE DIFFERENCE BETWEEN SALARY AND VALUE

The teacher earns \$128,000 and creates \$4,000,000 in value. The difference between how much the teacher earns and how much value the teacher creates is $\$4,000,000 - \$128,000 = \$3,872,000$. Meanwhile, the difference between how much LeBron James earns and how much value he creates is $\$75 \text{ million} - \$50 \text{ million} = \$25 \text{ million}$. Based on the difference between how much they earn and how much value they create, LeBron's job is more valuable than the teacher's.

METHOD 2: CREATE A DOLLAR-FOR-DOLLAR RATE

For every dollar that the teacher earns, the teacher creates $\$4,000,000 \div \$128,000 = \$31.25$ in value. For every dollar that LeBron James earns, he creates $\$75 \text{ million} \div \$50 \text{ million} = \$1.50$ in value. Dollar-for-dollar, the teacher's job is more valuable.

TEACHING TIP

According to the analysis by Stanford economist Eric Hanushek, a teacher in the 90th percentile will increase the lifetime earnings of a single class of 30 students by approximately \$800,000 (relative to an average teacher). To arrive at the \$4 million figure that we use in this question, we're assuming a secondary teacher with five sections of 30 students.

4 Some people believe that the best teachers should be paid more than they are. Watch the clip from the comedy show *Key & Peele* about an imaginary “teacher draft” in which all-star educators receive multi-million dollar contracts.

Why do you think athletes earn so much more than teachers do? Can you imagine a situation in which all-star teachers could earn as much as all-star athletes?

Students' responses will vary. Sample response:

It's unlikely that teachers (even the best ones) will ever be paid as much as professional athletes (even the worst ones). The reason comes down to economics, and in particular with how much value athletes and teachers provide to *the people who pay their salaries*.

LeBron's annual salary of \$50,000,000 is a lot. But LeBron is a big draw. By paying him so much, the Lakers earn even more each year from ticket sales, merchandise, TV broadcast rights, etc. (LeBron also generates excitement among fans and residents of Los Angeles, which could come in handy if the team needs to negotiate with the city to build a new arena.) Because the Lakers immediately benefit by having LeBron on their team, it's worth it to them to pay him a big salary.

However, this isn't the dynamic between teachers and school districts. The best teachers create a lot of value; according to the Stanford study, a top teacher can increase the lifetime earnings of a year's worth of students by up to \$4 million. Based on this, one could argue that a great teacher should earn a salary of \$4 million per year. The problem is that, while the students are the ones who receive the benefit of a great teacher, they're not the ones who pay the teacher's salary. Instead, the district pays the salary, and the district doesn't receive any of the \$4 million that a great teacher creates in value.

This may be why teachers are unlikely to earn as much as athletes; the economic incentives aren't aligned. In the NBA, the organizations who write the check are the ones who receive the benefit. But in a school district, the payer (the district) and the beneficiary (students) aren't the same. For this reason, a school district isn't incentivized to pay their best teachers in the same way that professional teams are to pay their best players.