

Grade 8 Group A- Glimpses of Solving the Movie Theatre Problem

>> So, a couple of you have the content on your device or do just, are you just getting it. Yeah, okay.

>> Yeah, I'll go write that down.

>> So, \$5.99 for- Curtis.

>> 23 litres.

>> So, we can do the sizes and then the correct sizes.

>> What are you thinking here? What would be a good way to begin?

>> Well, what we were thinking is basically we want to compare the prices. Okay, so, say these are the prices and these are the litres, and millilitres, and we want to kind of, like, do [inaudible] multiplication to figure out what is, like, for a litre and how much should it cost. And, based on the rate we can tell that these are fair prices.

>> Yeah, you just said per litre, right? Okay. I, I think probably that's going to be really an efficient strategy. Okay, so, we'll see how that happens.

>> Yeah, and the last 1 is-

>> We find the problem is nobody wants to feel ripped off when we go to the movies.

>> 3-

>> Make sure we understand your mathematical thinking and that you justify your opinion fully.

>> There we go.

>> Okay.

^M00:01:12
>> It's 395.

>> Is this, in your table, this is your, maybe your hypothesis or just some, millimetres and-

^M00:01:17
>> Millilitres and, like, [multiple voices].

>> Okay.

>> And so, the price is [multiple voices].

>> Write that in-

>> Right, okay.

^M00:01:27
>> And then how many millilitres you're getting in each cup size.

>> And you have that right there.

>> Yeah.

>> Okay.

>> And for movie theatres who still want to make a profit.

>> Okay, yeah.

>> Yeah.

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>> It's probably a good reason why they're not charging you \$2 for the pop at the-

>> Yeah.

>> Okay.

>> So.

^M00:01:43

>> How should we-

>> That is the price and compare the prices and see how much the difference is.

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>> 140 plus 340, which would be 4, 4.25 plus 4.25 and see if this price would be that price, which it clearly isn't. So-

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>> How do you know it's clear? Like, you're doing some, what calc, like, how do you know?

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>> 91 cents.

>> If you double this-

>> Yeah.

>> It'd be 6, 8, 680-

>> All right.

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>> Which is a little, about 100 millilitres less than that.

>> And this is like 49 cents.

>> But this, 100 litres, only 100 litres over is already \$5 and this was 75 cents lower.

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>> Yeah, yeah. Okay. So, you're definitely not buying 2 smalls.

>> A really big ripoff.

>> For more than twice the profit.

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>> Chris has started.

>> Because it's, like better to get a medium than 2 smalls.

>> Yeah, that's-

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>> That's pretty good, Emma. 1 medium is better than 2 smalls. So, when people can share, they should share, maybe by that.

>> Yeah.

^M00:02:43

>> 1 of, each of the movie theatre.

>> Something happening with the, the cross product-

>> That was just a rough-

>> But it didn't work out yet.

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[Background voices]

^M00:02:59

>> Yeah.

>> 1, 8 profit.

>> We're going to start small.

>> What will be the price if they want the profit? To just bring the small-

>> 3.50.

^M00:03:12

>> Yeah, 3.50.

^E00:03:13 ^B00:03:17

>> 8.50 for 680, I mean, that's-

>> 3.50 for a small.

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>> Wait do we need to say that, why we're-

>> So, then, it's like, when are go to the 2 mediums better than 2 smalls.

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>> And they still get quite a bit of profit comparing to convenience stores.

>> Yes.

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>> So, I think it's a good price.

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>> I think that they can, that the 790 millilitres do you think is good? 790.

>> They're deciding on a fair price.

>> We're down to the small.

>> So, we're trying to put in a [inaudible] now?

>> They should do what's important.

>> I think that's what you did, though.

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>> A couple of years ago, they did, they took their cup sizes and they, their price of a medium. Right now, a medium is what a large was a couple years ago, and price, you're getting still for the same medium cup. So, you're getting more millilitres for same price.

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>> They took away their business.

>> Yeah.

>> When is-

>> We want the medium price to be \$4.25.

>> Because that's somewhere in the middle.

>> 1.4 litres.

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>> So, so this is-

>> Wait, wait, wait, that's doubled?

>> 90 millilitres.

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>> That makes sense. So, now you compare that with our price for-

>> And then we'll find out which one we think is-

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>> It's still kind of a, it's better than before, but I think that this is a much better price but even if you change it, it's still going to be a big difference.

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>> If there's multiple people, you should still go for the bigger size.

>> Yeah.

>> Everyone's going to enjoy much more than you.

>> Do you want to do it with the medium, too?

>> Sure.

^E00:04:53 ^B00:04:58

>> At least half, if not more-

>> Just like the last, like the first price.

>> Is from their drinks.

>> This 1?

>> Yeah.

^M00:05:03

>> So, I think that's a really good point to add.

>> Yeah.

>> So, 85 per cent is, do you have, like, a marker?

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>> And then are we going to say anything about this?

>> Yeah, that is, that, after we explain this, we'll say our prices.

>> After we explain these?

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>> No, after we explain this, this, we'll go onto what we think our prices should be.

>> Yeah.

>> And after we say the prices, we'll be like, even, and these are calculations from what we did before. If we double it and like this is the price.

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>> Yeah.

>> It's still-

>> It's still better to get 2 mediums than a small and, or, no, no, no.

>> If it's, yeah. So, we'll explain how-

>> You get a medium than 2 smalls.

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>> Yeah. A medium, 2 smalls. And we'll basically explain how even if you're getting ripped off, this price is less. Like, don't get ripped off that much because the movie theatre still needs a profit to obtain. So, I think this is why our prices are better and more fair.

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>> Let's write this on paper so we're more organised.

^M00:05:58

>> So, what is a fair price for each cup size? So, we know the small is \$4.25 for 340 millilitres and a medium is \$4.99 for 4, for 790 millilitres and large is \$5, like, almost \$6 for 1.3 litres.

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>> So, the next thing we did was compare those prices to what you can get in convenience stores and grocery stores. So, at No Frills, we can get around an estimated 1 litre for about \$2, which is already more than the medium and small for a lot less. ^M00:06:30 And in convenience stores, they are a little bit more pricey for a can. So, you can get them for about \$2 to \$3 and that's more than their small.

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>> After that, we compared to see if it'd be better get, let's say, 2 of a medium, or, sorry, 2 of a small for 1 of a medium. So, we add the 2 small sizes. That came up to 680 millilitres for \$8.50 and we saw that that was a lot millilitres for a very, very bigger price.

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And then we did that with the medium as well, to see if it'd be better to get 2 mediums than 1 large, and we saw that it'd be about, it'd actually be better to get 1 large and share that amongst 2 people than get 2 mediums. And, yeah.

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>> And now we also did some, like, Google search and basically we searched out what is, like, theatre, how much does a theatre make, profit, and we found that the theatre makes 85 per cent profit from only the concession stands, which is a lot.

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And, like, I doubt that they make that much profit from the movie ticket itself. So, we feel like this is not a lot. So, if you reduce the prices just, like, not by a lot, just by, like, a decent amount, the theatre will still be able to have a profit and we'll be able to have a much decent price. So, it's like a win-win situation.

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>> So, this is what we think the prices should be. So, for a small, we think that they should give us just as much as we would get in a small can, if we're being fair, and that would cost them \$3.50.

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So, we're bringing the price down by 75 cents, so it will still give them a fair profit. For the medium, we would do, once again, 790

millilitres but we would bring the price down to \$4.25.

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So, that was the price of their old small. And for their large, we would keep it once again at 1.3 litres but bring the price down \$1 to \$5 instead and then, we did some more stuff on the back.

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>> So, we did exactly what we did for the regular prices to see if it'd, it'd be better to get 1 bigger, 1 bigger cup than 2 smaller.

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So, for the medium, the small, you'd get 700, 708 millilitres for \$7 and that'd be a pretty good thing. But it, I'd suggest you get the medium. And then we did the same thing for the large and the same thing for the medium.

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>> And just to add on to what Sufi [assumed spelling] said about the 85 per cent profit from the concession stands, we were also, we were also told that the movie theatres make little to no profit on their movie ticket selling and stuff.

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So, the majority of their profit actually comes from concession stands. So, we want to make sure that they still have a fair price for their, I know. For their, for their snacks and drinks.

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>> Yeah, and I think that with our prices, it'll be much better priced compared to them because 85 per cent of profit.

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That's a lot, like, just for the concession stands and a lot of people don't even want to buy food from there. They just, like, bring their own which I'm not sure is allowed in some theatres.

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So, that's like a lot and I don't think that's, that's a really big ripoff for some people. And I think that our prices would help.

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>> Thank you.

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[Applause]

^M00:10:09

>> Carla?

>> You, you guys said that they make 85 per cent profit off of their snacks and the concession stand and they make little to no profit off the movie ticket. So, already bringing the factor that not everyone buys food or snacks or whatever from the movie theatres, if they bring their own, do you think that buy lowering the price-. Well, in my opinion, I think that they would lose a lot of money and what was your fair price for a large?

>> A large was \$5.

>> It was \$5.

>> So \$5. And then 85 per cent of that is not really that much, considering you have to pay, like, a lot of people and if not a lot people go to the movie theatres, I don't think that people would be making enough money.

>> Well, like adding on what Mr. Oldridge just said, because they're breaking records with box office revenue coming in, it's still showing that there's still a constant flow of people coming into the movie theatres. And to be quite honest, we also did more Google research that we didn't write down. But the movie theatres don't have a lot of people working there and they're making much more than minimum wage. And it's mostly teenagers, too.

>> To add onto that, I was at the IMAX recently in Union Square 1 and most of the workers were just together and chatting amongst themselves other than the people who were behind the concession, who actually did work. But, like, I saw a group of maybe 3 to 5 people just chatting

about 1 of the recent movies that came out. So, they're not really doing that much work and they're getting paid for it.

>> And also to add onto that, we said that the, a lot of people don't buy it, like, what we meant by that is a lot of people are trying not to buy it. So, they, if they want to keep, like, a good amount of profit for the movie theatre, they should at least lower the price a little bit so people are actually willing to buy something to eat. Lena?

>> I agree with you and, but, I disagree agree with Carla because when I went to the movie theatre, my mum bought us the little, the little kid's sized one because we couldn't afford, because, like, we were 5 and my mum had to literally buy for everybody. So, she's like always either getting a little-sized ones. So if it, the price was lower, of course my mum would buy and I'm pretty sure a lot of people would too. You know, when you lower the amount, people are actually willing to buy, and you'll actually make more than when, you guys, is that what you were going to say?

>> Yeah.

>> Okay. Then, yeah.

>> Exactly what I thought. So, like, they're already making a profit of having expensive things and not too many people are buying. But if they were the price and more people are buying, they'd kind of be making the same profit.

>> In summary, I'll pay \$13 to see Captain America 2 next week, how about you?

>> Yes.

Grade 8 Group B- Glimpses of Solving the Movie Theatre Problem

- >> Three hundred.
- >> Millilitres?
- >> Millilitres instead of 1.3 litres.
- >> Hey, what did you say?
- >> One hundred.
- >> Three hundred.
- >> Millilitres.
- >> What's that equal?
- >> Two point 1 7, right?
- >> Yes.
- >> So six--
- >> So the price increases.
- >> Which technically isn't a big deal for them.
- >> I think it's like -- do we not like [inaudible]?
- >> No you get more first. Because this is millilitres, right? So per cent.
- >> Fair for us or for them, because they need to make a profit?
- >> I guess fair for both like, it has to be something in the middle. Because like they need to pay for stuff [inaudible].
- >> Yes, well they need to pay to get the cups and they need to pay to get the--
- >> drinks, like the soda.
- >> Yes, the soda.
- >> And then everything else [inaudible].
- >> And then they have to [inaudible]. So--
- >> Well, I feel like you always have to -- you have to bring so money to the movie theatre now if you want [inaudible].
- >> I mean you could just sneak your own.
- >> What do we think is a fair price?
- >> Okay, well how much money do you [inaudible]?
- >> [Inaudible] normally [inaudible]?
- >> [Inaudible] buy the cups and the drinks and everything.
- >> So [inaudible].
- >> They have too add a little more money like besides buying the cups and the drinks because then like they won't make any profit.
- >> But like still, if you can [inaudible] how much do you normally pay for like a soda?
- >> [Inaudible] it could be [inaudible].
- >> Maybe two dollars, right? But like, 5, 6, dollars?
- >> Well this website says if they make an 85 per cent [inaudible].
- >> [Inaudible] profit at the concession stand.
- >> Yes, it's not so much seeing the movie. It's the food.
- >> Food.
- >> Well the thing is, you have to think of how much they spend like per annually.
- >> And if they reduce the prices, like the concession stand, how much would we be paying for movies?
- >> Yes.

>> I think they're high too.
>> Yes.
>> Eight dollars for two hours of movies.
>> Well when you think about it, the amount of time to entertainment. Like if you look at it that way.
>> Yes, but if you think about like how movies, you can get them like free on Netflix or like other things. So like eight dollars generally a movie is high.
>> But then like they have to pay for like [inaudible].
>> They're trying to make money.
>> They run like all of the time, in like 24 hours. So you have to kind of think of everything and their expenses too.
>> 85 per cent profit.
>> Off of consumers.
^M00:03:05
[Silence]
^M00:03:14
>> Well I think we should add like -- I don't know. How many people would come to a movie theatre and like how much profit would they be making? How much money would they actually be making?
>> Well should we -- okay, should we take one of these and decide it's the fair price?
>> [Inaudible] pay for services.
>> Yes, they have to pay for everything. So it can't just be a regular price.
>> A bunch of people [inaudible].
>> [Inaudible] a ticket. And also be thinking about it.
>> [Inaudible] five per cent profit off of everything.
>> At this price like for this bottle, this costs more to make like -- because when they're buying like the Coke and stuff, like they're buying it in bulk, right? So they're just buying like the weird gel stuff that they put in the machine and like the gas. So this cost -- it costs less for them than the people who are selling these bottles.
>> Exactly, so [inaudible] for them to charge you know, more than what a Coke bottle would charge because a Coke bottle takes more effort?
>> I think this generally is a lot of money just for a drink pay for a lot of things.
>> Yes because then--
>> And 85 per cent profit though, okay?
>> Okay, so we just limit -- it's like expensive though.
>> So how much?
>> The big theatres and everything.
>> I know but, think about how much money you pay every time you go to a movie theatre.
>> So what we did with the prices was we tried to figure out how much like drink you would get for one cent. So for the large, it was the most fair price. You get 2.17 millilitres per cent. For the medium you get 1.5 millilitres per cent. And then for the small, it's the least fair price. You get 1.8 millilitres per cent.
>> We found a website that the average bottle of Coke is 500

millilitres and costs 2 dollars, which means you get 2.5 millilitres per cent. And this is a fair price because we always want the most amount of millilitres per cent, but the company's still getting profits.

>> And then we searched it up on a website and we found that movie theatres get an 85 per cent profit off just the concession stand. So we thought that was a little unfair because they buy things in bulk and then get -- they pay like less for it, because you know, it's bulk. And then for an average bottle of like Coca Cola, you pay 2 dollars, so we -- and that costs more to like make and everything. So we thought that was kind of an unfair price.

>> But we also needed to like understand that it was -- they need to pay for all the people like serving us and like the people that have to clean up after us all those things. So, we understand that they need some profit and some things that they can use some money to pay them.

>> Yes, but we think that like customers should deserve a reasonable price. So we thought they should get at least 2.5 millilitres per cent.

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[Silence]

^M00:06:25

>> We know it's somewhere around there. And we should -- you really shouldn't be paying like 0.8 millilitres per cent to get like for 4 dollars. Like 4.25's not -- it's not fair to pay that much and get like so little back. So we decided you know a fair price would be you know, better.

>> Yes.

>> And then the things I was thinking was new rate, millilitres per cent. So yet another one that was useful. But also that they're fair minded. These could be the future small business owners of Canada because they're very fair minded about the things they would have to pay for like employees to actually you know, press the buttons to get the drink in the container, and how much it costs to make. So you could have a whole inquiry there if you were interested. How does this 85 per cent profit margin work and what's acceptable to a business? Lots of great thinking happening.

^M00:07:22

[Silence]

Grade 8 Group C- Glimpses of Solving the Movie Theatre Problem

>> Over here, then, do we have any ideas about a good strategy to make a decision in this case?

>> For it to be \$5.99 is a little bit overpriced but it's okay. So, then we're probably going to figure out a good price and we use cross multiplication to figure out.

>> Yeah, and then, and you can really find out if you think 1 of them is priced out of line or not. Carla, are you going to use 1 of those to help decide what's a fair price?

>> Yes.

>> Okay, that's good. Because they're always using the information they have. That is actually the next problem. But there's information embedded in there from supermarkets.

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>> Okay, well, let's, an average litre.

>> So, let's, let's take out all the calculations here.

>> Twitter?

>> So, I-

>> So, it's three 2-L bottles.

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>> They're, yeah. Three 2-L bottles for 6 bottles.

>> Yeah.

^M00:00:51

>> So, how did you get those, those numbers there. 4,000, yeah.

>> Well, here the size-

>> The total.

>> Oh, okay. I see, okay. I see.

^M00:00:59

>> They're multiple cans and-

>> Right, right. That makes sense. Okay.

>> Well, okay. I mean, a small, I guess it'd be closest to, for.

>> So, 395 divided by 12-

>> Yeah.

^M00:01:14

>> And then divided by 10 to find a price of 1. And then-

^M00:01:18

>> Sorry, can you say that again? You, you, you, which 1 is it like? Oh, 395. I see. That's what you're looking at. Okay.

>> Then, to find out the price for 1 can.

>> Divided it by 12.

>> Okay.

^M00:01:30

>> What's that number represent that, that you're, you've got there.

>> You mean here? Well, this 1-

>> The 1 can.

>> Yeah, that's the 1 can.

^M00:01:40

>> Actually, no. We shouldn't have done that. It should've been.

>> If there's only, like 1 here [multiple voices].

>> Okay, so we have 12 [multiple voices] litres, 1 [multiple voices].

>> We should've divided that by.

^M00:01:51

[Background voices]

^M00:02:14

[Silence]

^M00:02:21

[Background voices]

^M00:02:26

>> Okay. All right.

>> This one's only 49 cents per can? Wow.

>> Oh, because it's smaller can. Okay, all right. Okay, so how's that helping you to, to make a decision about the answer?

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>> Well, we're going to compare the closest size, the closest grocery store size, and then compare the prices and see which price we would find.

>> Right. Okay.

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>> Why the difference between the small and the medium is much smaller the medium than the large.

^M00:03:00

>> Yeah, and then you, we should find the rates in between the current movie theatre prices, too. And then we should-

>> Maybe 6 times 4-

>> I think the medium is the best pricing, to be honest.

>> Yeah.

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>> So, that's the first one. Okay, now that we've found a compromise, we've found like a [inaudible]. Now that we've found the compromise.

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>> We're, now we're deciding which ones we're going to use, this one, this one or this one. This one, this one, this one, or this one, because we need to keep a set of prices. This is just the rates.

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>> I think we should each, I think we choose the least price, you know I think we should choose the rates and a display in this one.

>> Yeah.

^M00:03:37

>> But I think we should explain everything.

>> Yeah, I know. And right here, it doesn't matter if we use this 1 or this 1, because the prices are the same.

^M00:03:46

>> Yeah.

>> And this one could be like the outline.

>> We got, yeah, we got a pre [inaudible].

>> Yeah.

^M00:03:56

>> Do we have another marker pen? Just, like, highlight them or something in a different colour because I can't see those.

^M00:04:00

>> So, our problem was what's a fair price for each cup size. So, first we took all of the prices from the movie theatre, the large is 1.3 litres for \$5.99, medium is 790 millilitres for \$4.99 and the small is 340 millilitres for \$4.25.

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And we compared those with 5 name brands from the grocery store. So, a pack of 6 of 710 millilitres is \$5.29, which would be 88 cents per can. A pack of 6 of 237 millilitres is \$2.99, which would be 49 cents per can. Another pack of the 6, 237 millilitre cans would be \$5.49 cents, which is 91 cents per can.

^M00:04:40

Three 2-L bottles for \$6 would equal to \$2 per bottle and a 12 pack of 395 millilitres would be 83 cents per can.

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>> So, we figured out first that the easiest would to find, would be to find a compromise between them. So, what we did with corresponding colours, we took the amount of the movie theatre drinks and then we've tried to find the amounts that was closest in the grocery store.

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So, for the large, for 1.3 litres, it would be to get the, like the entire 6 pack of 237 millilitres which would be equal to 1.4, 122 millilitres, so that was pretty close. And we just found the mean for that. And then for the medium we did the same thing.

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The green, 790 millilitres, which would be 1 of the 710 pack, 1 of the 6. And the small, it was 340 millilitres at the movie theatre and we found that was closest to 394 millilitres.

^M00:05:45

>> Okay, so after we did that, so, we found the mean over here, and then we decided, you know, we should find the ratios for that, too. So, we took for example the large and we did, using cross multiplying, 482 here with the amount.

^M00:06:00

So, from here. And then we took medium and we did X for the price, and then in quantity here, and then using cross multiplying, we found the prices for each one. So, here we did using the large, here we did using the medium, and then here we did using the small. And you

notice that these prices, these prices and these prices were more or less the same except for the small.

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And then here and here the prices were all the same except for the medium and the medium here with a 1-cent difference. And the small, it was the outlier because the prices were way off. So, we decided that if we were going to use a price, it would be either the large or the medium because they're the same except for the 1-cent difference.

^M00:06:45

>> Yeah. My personal, the reason why I took this photograph was that my personal feeling and just from the visual information at that moment, at the concession stand, I felt that the small was the outlier. So that's, that's nice to hear because that's actually what I had thought. Not that I'm always right, but I thought the same as you.

^E00:07:07

Grade 8 Group D- Glimpses of Solving the Movie Theatre Problem

>> I mean if we look at it.

>> Oh, sorry.

>> From the business point of view then I think it's fair enough.

>> It's far.

>> Well, if in the business point of view.

>> But they wouldn't have the cheapest price because it's at a movie theatre. You can get it cheaper from like No Frills.

>> I know. Like go to No Frills get some [multiple speakers].

>> Yeah. Price match.

>> When you go to the movie theatre they won't let you like bring your own.

>> Yeah. Yeah, they don't let you bring your own drinks. Yeah.

>> Yeah. Because they want you to buy.

>> They want you to buy.

^M00:00:22

>> And then the larger ones, well, yeah. The larger one is \$6.00 because obviously if it's going to be \$10.00 then nobody's going to.

^M00:00:27

>> Yeah. Nobody's going to buy it. Right.

>> Yeah. So, it has to be a reasonable price, but when compared to the.

>> This other one is.

^M00:00:32

>> It should only be like a little bit bigger, right? OK. So, [multiple speakers], OK, so should we say that we're looking.

^M00:00:41

>> If you're looking at prices or something.

>> Or.

>> [Multiple Speakers] business point of view.

>> [Multiple Speakers] the price [inaudible].

^M00:00:47

>> I mean, yeah, they make sense.

>> But if you want to talk about how fair something is, it's just not, it's not fair.

^M00:00:54

>> It's not fair at all.

>> You want to compare the prices to like [multiple speakers].

^M00:00:59

>> My juice box has more like - it's almost [multiple speakers]. If you have a really big juice box.

^M00:01:03

>> There are obviously a lot of children's movies that, that are [multiple speakers].

>> And the kids want a drink.

>> Yeah.

^M00:01:09

>> You don't want the kids to waste the drink, so they, you get them a smaller drink.

>> Yeah.

^M00:01:12

>> What about the popcorn that they eat? The popcorn it's going to make them thirsty.

>> Thirsty. Yeah.

>> Yeah.

>> That's why they make [multiple speakers].

>> That's why they make the popcorn like extra salty so the, so they're thirsty and they want to drink more.

^M00:01:23

>> OK. So, let's start the fact that many families bring.

>> Their children.

^M00:01:28

[Background Discussion]

^M00:01:31

>> And plus they don't let you bring your own food in.

>> Yeah. If they did let you bring your own food and then you wouldn't be paying for anything.

>> Canada's wonderland is the same thing.

>> Yeah.

>> It's a lot of bit commercial places because they have a lot of risk. OK. It's \$5.99. It's one-litre. No Frills, you know.

>> No Frills like \$4.00 man. Like seriously?

>> Four bucks. Yeah.

>> What's the point?

>> Yeah.

>> What's the point of [multiple speakers]?

>> For two-litres.

>> Exactly. If you're [multiple speakers].

>> I think it also has to do with what's called the theatre as well. I mean if it's a well known theatre then I think that also adds on to a person's [multiple speakers] yeah, and like once again it makes perfect sense if we look at it from a business right? ^M00:02:11 Because, yeah, look you'll see what I wrote. Businesses thought that through, right? That children will most definitely be a smaller drink so that they don't waste it. And that's where they intentionally made the drink more expensive as opposed to the other drinks [multiple speakers].

^M00:02:23

>> I think they need to have one drink that seems to be.

>> A reasonable price.

>> Yeah.

>> A reasonable price or cheaper so that they can actually.

>> Sell more.

>> They can actually confuse or, you know, in a way persuade the consumers.

>> [Multiple Speakers] I don't know [multiple speakers] but if they sell it cheaper then they're going to make a lot more sales.

>> So your consumers to think that, you know, you're overpricing everything, right?

>> Yeah.

>> So, they're obviously going to make one cup price looking cheap. I mean, they're going to give it a cheap price, right, so that it can actually, it can look like they're not actually asking for a lot. But the thing is not many people are going to buy large drinks because.

>> Yes. The people who do though might say that's a good deal. Or they have free refills. But it's a crazy amount.

>> Oh yeah [multiple speakers] and we feel like 1.3 litres, it's \$5.99 but for adults that's OK. Like it's \$6.00 I'm OK with that price [multiple speakers] to pay for adults.

>> The small one though, that doesn't make sense.

>> But the [multiple speakers] medium one.

>> Even the small one.

>> And like small, that's not.

>> That's overpriced [multiple speakers].

>> That's what I think, the small one for sure [multiple speakers].

>> But see if you can come up some numbers proof now.

>> OK.

>> OK..

>> OK.

>> This one started from critical thinking and strong opinions, but I wanted to know how you decided on your prices in the end.

>> It was pretty close when it happened.

>> Yeah.

>> And so that's why we, half the price is low, and then we added a third more in price here because, you know, this is almost a third more.

^M00:03:48

>> That's a good idea. So, a third more. So, a third of. Awesome. A third roughly of \$4.99.

>> Yeah.

^M00:03:58

>> There's never anything wrong from starting from knowing. Like I knew as well from, and that's why I snapped the photograph. Like there's nothing wrong with knowing and being able to justify it with math is amazing.

>> Yeah.

>> But in the real world it'd be like in most situations that's a little too little if I want a pop. But for me the one, you know, the jumbo one would always be way too big. And this is what a lot of consumers do. A lot of times we land in the middle because of that. Too big too small. Just right.

>> Wait, so No Frills was how much?

>> It was like \$2.00, wasn't it? For like.

>> Yeah.

>> Even on sale sometimes.

>> Yeah [multiple speakers]. So, it's, but then once it.

>> I asked for twice as much as that.

>> But then you should also say that since it's a movie theatre it should obviously be [multiple speakers].

>> Yeah. It should obviously be a little bit more expensive.

>> Because of, you know, [multiple speakers].

>> Movie theatre. Yeah.

>> I fully understand, but [multiple speakers]. Yeah.

>> Who is in to what?

>> Well, comparing [multiple speakers].

>> Yeah.

^M00:04:54

>> Should we just a [multiple speakers]? Like if each one of us do like one single point. So, we do like business, like our [multiple speakers] is like how they only, when the kids come in.

>> But if we do points is going to like limit what we're going to say? I think we should [multiple speakers].

^M00:05:08

>> That's what I'm saying. No, but we take turns like that.

>> If you miss out on something, let's say I miss out on something just, just add it on. OK? OK?

>> Just take, don't take too much time [multiple speakers].

^M00:05:18

>> Oh yeah. You can forget the reputation part [multiple speakers].

>> Yeah.

>> Yeah. You guys can say that I guess.

>> I can [multiple speakers].

>> [Multiple Speakers] kids, yeah. We can't forget the kids. Can't forget the kids.

>> Well, yeah because that's [multiple speakers] that's like the most important part.

>> Well, what's a fair price? So, unlike the other groups we weren't as mathematically concentrated. We decided to look at point of views as well. We started by looking at the business point of view. And when looking at the prices we think that it's complete sense with the prices listed. For example, if we start with the fact that many, so obviously the small drink is the most expensive, right? \$4.25. And as the other group mentioned was the outlier when compared to all the other prices. But if you look at it, most families bring children with them as there are a lot of family movies at movie theatres. And so, I mean, most children drink from small cups, right?

>> Yeah. And they don't want their kids to waste the drink. So, that's

why they make it even more expensive, so you have to buy it because you don't want to waste.

>> Exactly.

>> Yeah.

>> And then the point was to make the large drink the cheapest because obviously the motive of a theatre.

>> Business.

>> Or business.

>> Is to make money.

>> Is to make the most money possible [multiple speakers]. So, basically in a way playing mind games and confusing you into thinking that something that is one-fifth is only \$1.75 below. And we can give you an example if you want. If we have a family of three children we can that the adults would buy the large drink because it's only \$6.00, which it's only around.

>> It's affordable.

>> It's affordable. Right. And then the children they will buy \$4.25, and that will add up to a higher price.

>> Yeah.

>> And because there are three, right? And then. OK. Consumers.

>> It's also you have to think of the other person's point of view when you price the cups. And it's sort of, it's, again, it's another way playing mind games, right? So, you lower the price of certain cups, and you raise the price of other cups to make them, you know, to make the person buy the cups you want.

>> After considering both sides, both points of views, we decided that the medium price.

>> Yeah. Medium price [multiple speakers].

>> Which was \$5.00. It was OK [multiple speakers]. And then we decided that, well, we added 340 millilitres and 790, but if they can then they should just close it up.

>> Round it. Round it.

>> Round it. Right. So this should be 800 millilitres while this should be 400 millilitres. This should be 1,200 millilitres, 1.2 litres. So, we're going to keep that price. And since this will ultimately be half the price of here, we're going to [multiple speakers]. Yeah. It's in half. And that's a third bigger, so the price will also be a third bigger. And then we also looked at comparing. Right?

>> Yeah. Comparing the prices.

>> Well, once again.

>> Compared with No Frills in Wal-Mart.

>> Yeah.

>> Yeah, but we're also looking at the reputation.

>> [Multiple Speakers] reputation.

>> Of the movie theatre.

>> It's also about like the ice because when we put the ice in, the ice doesn't cost that much. You can make ice at home and bring it there free [laughter]. It's cheap as water. We get, get, get cheap water.

>> Oh yeah. And then, but if we had to decide which way we want to go we decide that the business point of view is the ideal or the best point of view because sure we have to pay more money but that also helps with our economy.

>> Yeah. The stocks and all that, you know.

>> Yeah.

>> Invest.

>> In the long run. Yeah.

>> Everybody invest.

>> OK. Yeah. Thanks.

^M00:08:52

[Applause]

^M00:08:54

Grade 8 Group E- Glimpses of Solving the Movie Theatre Problem

^M00:00:05

>> Millilitres on average.

>> Can of pop.

>> Pop can.

>> Oh, that works too.

>> It phrases it better.

>> Yeah, the can of pop.

^E00:00:16

^B00:00:20

>> Yeah, here we go. I think. It's 12.

>> Twelve oz.

>> So, 355, 355.

>> That makes. OK.

>> Wait. Don't. 355 times 12 times 2.

^E00:00:33

^B00:00:35

>> But where do I put the millilitres then? Wouldn't it be like 3 times 12 times 2 times 355?

>> No, it would be, because it's.

>> Does it really matter if we multiply them differently?

^M00:00:49

>> Sometimes because it's two boxes of 12 cans. And that one can has 355 millilitres. So, 355 millilitres, so then that's times 12 and then that's times 2.

^M00:01:05

>> But where do I put, but then millilitres it won't continue to list.

>> It kind of will.

>> No because millilitres would be at the end.

>> Well, we could switch this around.

>> And it'll.

>> We could switch this around.

^M00:01:16

It's not a big deal.

^M00:01:17

>> OK. Wait. What do you want me to write?

^M00:01:19
>> OK. 355.

^E00:01:21
^B00:01:23
>> Millilitres.

^M00:01:24
>> Millilitres times 12 times 2.

^M00:01:30
>> And that's a ratio of 2-12's. \$10.00?

^E00:01:34
^B00:01:38
>> OK. Now we're just using our list, right?

^M00:01:39
>> Yeah. We only have five?

^M00:01:40
>> And now we need to convert all that to.

^M00:01:42
>> Oh my gosh.

^M00:01:43
>> To common.

^M00:01:45
>> Denominators?

^M00:01:47
>> Kind of.

^M00:01:48
>> Common ratio things. Whatever you call them.

^M00:01:51

>> Are these even fractions?

^M00:01:52

>> They're not fractions.

^M00:01:54

>> They're ratios.

>> They're ratios.

^M00:01:55

So, we need to, well, first of all we need multiply.

^M00:01:59

>> So, don't we just multiply all, didn't we just do that before we wrote it down?

^M00:02:01

>> Because this is the first step, and then we do the next step. And then we need to figure out the rest of those so, if we take this.

^M00:02:08

>> I like how this is just really simple. And then the rest are all going to be, this is going to be really expensive compared to that one.

^M00:02:16

>> Well, this one is.

>> Are you, and you're going to go back to movie theatre, right?

^M00:02:19

>> Yeah. We're going to go back to the movie theatre.

^M00:02:20

>> Yeah, so in this case you're using the information from the collage about different pop sizes at the grocery store.

^M00:02:28

>> Just get an idea of what's going to [inaudible].

^M00:02:30

>> Yeah. And you're going to have a good idea. So, you're thinking the ratio between all five, is this some kind of average of what?

^M00:02:38

>> Yeah, but then we're going to kind of the average and compare it to this .

^M00:02:41

>> This is a great idea. Also, I haven't seen this strategy yet today. So, taking five different reference points and averaging them out will give you, really, really give you something to know what's better.

^M00:02:56

>> Yeah.

^M00:02:58

>> I think you're very thorough, and you're just really, you're just really being thorough about it. It's great.

^M00:03:04

>> And then.

^M00:03:06

>> So, just tell us what are you finding here?

^M00:03:09

>> We're finding the average so we can then go onto the movie.

^M00:03:13

>> The first question.

^M00:03:14

>> The first question because we did the second one first so we'd get a better feel for the.

^M00:03:19

>> Because we don't buy pop.

^M00:03:20

>> Oh, OK.

^M00:03:21

>> Yeah, we don't buy pop. So, we don't, we don't really have an opinion on the first question. So, we're kind of forming an opinion with the math.

^M00:03:28

>> Oh, OK.

>> And then we'll go to the.

^M00:03:29

>> Oh, whoops.

^M00:03:31

>> That's the first question, and then we'll determine the fair price based on 1.3 litres or it was 790 millilitres and 340 millilitres.

^M00:03:47

>> It's kind of hard to have an opinion when like you don't know what the price like sort of should be because you can't tell if it's expensive or not if you don't know, look at everything. Oh, I write that down, right, OK.

^M00:04:00

>> Per dollar.

^M00:04:01

>> Millilitres.

^M00:04:02

>> Yeah. Millilitres per dollar.

^M00:04:04

>> Per dollar. OK. Which means that this and this and this are all overpriced.

^M00:04:14

>> OK. And so is all this.

^M00:04:16

>> OK. These three are all overpriced. So, it's just these two.

^M00:04:19

>> And this one. This one is cheapest I think.

^M00:04:21

>> Really?

^M00:04:22

>> Because you have to pay more to get equal to this.

^M00:04:26

>> Oh yeah.

^M00:04:27

>> So, that is, we can say that.

^M00:04:30

>> That makes sense.

^M00:04:31

>> We can say that.

^M00:04:33

>> What do we even call this?

^M00:04:35

>> Company number four.

^M00:04:39

>> The 3, the 3 times, the 3 bottles of [multiple speakers].

^M00:04:47

>> So, it's the cheapest.

^E00:04:50

^B00:05:00

It's \$0.50 because if you divide this by 2 you get roughly that and by this you get \$0.50.

^M00:05:07

>> Actually, it's only \$0.01 off, so it's only \$0.50. So I'm just going to write that. OK?

^E00:05:13

^B00:05:27

>> Approximately [multiple speakers]. So, every 339 is \$0.50. And half of that is.

^M00:05:40

>> 339 divided by 2, 169, but you're running up, right? To 70? 170?

^M00:05:48

>> Yes.

^M00:05:49

>> Yeah, 170. But we want 112. So, it'd be less than \$1.25, so it would be \$1.00, well, a couple of things.

^M00:05:58

>> Why are we being so approximate when it could just be like we're just deciding what's fair for us? You know, for fair for me I think I would just make everything free.

^M00:06:10

I don't even know what you're doing. You confuse me.

^M00:06:13

>> OK. So, every cent is, every cent is 6 millilitres roughly rounded up to 7.

^M00:06:23

>> OK. 7 millilitres is \$0.01?

^M00:06:26

>> Yes.

^M00:06:27

>> So, if we use that.

^M00:06:28

>> But why didn't we like just divide 790 by like 7 to get the amount of cents.

^M00:06:34

>> We can do that now.

^M00:06:36

>> 112 divided by 7. That's 16.

^M00:06:40

>> But we want to.

^M00:06:41

>> Isn't \$1.16 then?

^E00:06:43

^B00:06:52

>> The above prices are what we think is fair.

^M00:07:04

>> So, we went the roundabout way because we did both questions because everyone knows that the prices at the movie theatre are not fair at all. So, we can't average those out. So, what we did is.

>> We did the second question first, so we made like, we had to find the ratio of how many millilitres there are per dollar, which we did here. So, first we wrote down the quantity of.

^M00:07:30

>> We wrote down --

^M00:07:31

>> The amount of like cans or bottles and the times the amount of millilitres for the price. And then we just did the calculation here and then made it like averaged into \$1.00.

>> So, then we added them all together and averaged it into 678 millilitres per dollar. And then we went to the movie theatre, and we were, we're not being exact. We're just approximating here. So because this would be, it's half of this give or take a bit, so we put it into 150. And this is a little bit more. The difference is 102. So, we calculated that would be 116.

^M00:08:17

Cents.

^M00:08:17:15

>> Yeah. Cents. \$1.16. And then.

^M00:08:19

>> And then the third one because half of 678 is 339. So, we rounded that up to 340. And so since it's about half of this it's only \$0.50. and that's what would technically be fair.

^M00:08:35

>> If you just took the prices from the store and put them in the movie theatre.

^M00:08:40

>> Yeah.

^M00:08:41
[Applause]

^M00:08:45

>> Yeah. This is, this is, so, what they did they basically stole what was going to be my next task. Because these students are so good they do two problems at once. But the grocery store reference point allowed you to decide what's fair.

One thing I notice here is how precise you are. It should be \$0.50. Should be a \$1.16. Should be 250. That's great. And so having the extra reference points allowed you to draw those very, very specific conclusions. So, that's great.

^M00:09:18

[Applause]

^M00:09:21

Grade 8 Group F – Glimpses of Solving the Movie Theatre Problem

[Inaudible]

>> Basically doubling the size and getting more. But it's not fair if you want the medium to large [inaudible].

>> I can show you the tweets [inaudible]. Mister -- is it on Mr. Oldridge math? Oh, no. It's on Twitter, too.

>> Matthew Oldridge: I tweeted that question several times, so it's there.

>> So why don't we just do this, we develop, like, an understanding of how much, like, one millilitre would cost.

>> Just basic math again. Because then if you think about it, going from the small -- because basically if you double this, it's less than. If you double it, you get 6.80, which is less than that. So you're basically getting more for your money [inaudible].

>> So we should just make ratios of how much one millilitre would cost.

[Inaudible]

>> And then you would have a smaller ratio.

>> What are you going to try to calculate?

>> We're basically trying to figure out how much a millilitre would cost to buy it, like, for the drink.

>> Okay, so one millilitre? Oh, okay. All right. Okay.

[Inaudible]

>> Okay. So what have you got?

>> I just did 240 divided by \$4.25 and I got 80.

>> So it would be 80 cents?

>> Matthew Oldridge: What does that 80 represent, sorry?

>> It would be 80 cents for every --^*

[Inaudible]

>> Matthew Oldridge: So how did you know? You said you don't think

so; how do you know?

>> Because if you say 80 cents per millilitres, there's 430 millilitres. So that would be way more [inaudible].

>> Matthew Oldridge: Oh, okay. Okay.

[Inaudible]

>> Matthew Oldridge: So that's -- so what is that number?

>> So we just switched around, did \$4.25 divided by 340 millilitres and we just got 0.0125. [Inaudible]

>> Matthew Oldridge: Okay. Well, what does that number represent, then?

>> How many cents for one millilitre?

>> Matthew Oldridge: Okay. And that's for which size?

>> The small.

>> Matthew Oldridge: Okay.

>> Like as you said, 340 plus 340 would equal 680 millilitres. And if you do -- like, basically you get 790 millilitres for, I guess it would be 74 cents more.

>> Matthew Oldridge: Uh-huh.

>> You get 790 millilitres, you get more for a better price.

>> Matthew Oldridge: Oh, okay. So all these calculations, how are they going to help you make a decision about fairness?

>> So if you're going from the small to the medium, you're paying maybe a little bit more but you double the amount of the small.

>> Matthew Oldridge: Okay.

>> But if you go from the medium to the large, you're going -- if you were to double 790, you would get more than one litre -- 1.3. So basically, you're actually paying more for not getting more.

>> Matthew Oldridge: Right, right. Okay.

>> That's just a rough estimate.

[Inaudible]

>> Matthew Oldridge: Why does it have to be the other way? How did you know that?

>> That's not it.

>> Matthew Oldridge: That's not it?

>> That would be, like, \$100.

>> Matthew Oldridge: Okay. So now what do you got?

>> 0.0046.

>> Matthew Oldridge: For what?

>> For the millilitre. But I feel like it's not right.

>> Matthew Oldridge: You feel like it's not right?

>> It just --^*

>> Just for the large one, right?

>> Yeah.

>> Matthew Oldridge: Why do you feel like it's not right?

>> I really don't think that it would cost, like, that little to make one millilitre.

>> Matthew Oldridge: Okay.

[Inaudible]

>> Matthew Oldridge: Okay. So what are you guys going to do with this information now?

>> The majority of people, if you think about, when they go somewhere and ask for a drink -- like my friend here said, he said that "How much would a litre of Coke cost?" So if we can find that basically, you could average out the price of how much a large would cost and how much a small would cost.

>> Right.

>> So basically with that litre, who would profit more -- would the company of Coke profit more or would you profit more from all of this?

^M00:04:38

[Inaudible chatter]

^M00:05:00

>> Matthew Oldridge: This is your -- what was this from again?

>> This was the average Coke.

>> Matthew Oldridge: This was your average price.

[Inaudible]

>> And then for the highest place to be, like, where it's sold is in Switzerland. And it's approximately \$5.59 for 500 millilitres. And that's in Switzerland. And did you know the lowest price is ten cents?

>> Where?

>> In Estonia. No, I think it's in South America.

>> Yeah, how much was it?

>> Estonia is above Latvia.

[Inaudible]

>> Try this because we know the highest price that it's sold and we know, like, the lowest price. Because, like, ten cents and the highest price is \$5.59. So why don't we try, like, getting the average and, like, the mean. So that would be a good price for the medium. And that's for 500 millilitres.

>> But only \$5.59, that's only in Switzerland.

>> Yeah, but still we could get a good price ranging from those two -- the highest and the lowest global average price of, like, Coca-Cola and how, like -- like, I'm just going to explain, like, the average price. So it's \$1.58, and then how much expensive it can be in some places, how much cheaper it can be.

>> Okay. And then I'll do where small, medium -- which is more cheaper, which is more expensive? So, like, what the difference is, if it's worth it to, like -- yeah, 74 cents more.

>> I'll explain that why we did -- like, how we converted this to this and this and tell them which one is cheaper and turn that sound down. So yeah. What I'm going to do, right?

>> Yeah, in the end I'll basically conclude if we think between all the drink cups, which would be the best price for it and why.

>> Matthew Oldridge: All right. Let's go ahead.

>> So basically what we did is put the prices and the quantity of each cup. So small was 340 millilitres for \$4.25; medium was 790 millilitres for \$4.99, and the large was 1.3 litres, which is equivalent to 1300 millilitres for \$5.99.

>> So then after that, we converted it down to how much you would pay for each millilitre. So for the first one, we just divided it -- the \$4.25 -- by 340 and then we got one millilitre for every one cent. So about one cent. And then for the medium, we did the same thing. So got one millilitre for every \$0.006. And then for the large, it's cheaper. And so it's one millilitre for every \$0.005. And so after we got the price of, like, the millilitres I wanted to find, like, the price that -- like, the global average price. So I found this website and they said the -- and I think it's a good website because it has, like, the global average price and the highest price and the lowest price that's been sold in different countries. So like, the global average price right now is \$1.58 Canadian. So we were thinking about it and \$1.58 for a 500 millilitre bottle of Coke. So if you were to see \$4.25 for 340 litres, we were saying if we were to find a good price for it, that would definitely not be a price just for a mall and you're only getting a small quantity. So we got how much it would cost for one millilitre if it was \$1.50 and it had 500 millilitre. So one millilitre would be equal to 0.0006 -- that's how much it would cost for one millilitre.

>> So basically in conclusion me and my group, we feel that a large is the best price for the cups because even though you're paying a little bit more, you'll be getting more for your money. And also, as you see from the Coke, an average person here would probably buy a Coke. So the large you would save money. And you'd pay more but you would also be saving money by going with the large.

>> Thank you.

>> Matthew Oldridge: It just popped into my head that the global price was a really interesting benchmark and I was impressed that you found it. Because I thought that it would be something that businesses would use to set their own price, you know, maybe movie theatres and other businesses use that to set their price. And I thought that was a great bit of research that really added to your solution. It was a great idea.

>> Thank you.

>> And it said the highest price of, like, Coke in, like, Switzerland, it's approximately \$5.59 for 500 millilitres.

[Inaudible]

>> And the cheaper is ten cents, and that's in Estonia. So.

[Inaudible]

^E00:10:16

Grade 8 Group G- Glimpses of Solving the Movie Theatre Problem

[Background Conversations]

^M00:01:18

>> So how is that going to help you?

>> [inaudible] we are showing that, like, 304 – okay. They're not exact. ^M00:01:25 But we picture that 340 millilitres would be about almost like a half of 790 millilitres.

>> Right.

>> And it is because 340 times 2 was 680, I think.

>> Yeah.

>> So basically it's almost double 340; but it's a little bit more. So basically, if you're buying a cup for a – if you're buying the 790 millilitres' cup, then you'd be getting it, like, more for what you ask for it. Because we would set a purpose for a dollar because it's pretty small.

>> Right.

>> And you know, a lot of people won't – wouldn't buy that for, you know, a lot of money.

>> Right.

>> So we think that a dollar would be reasonable for – reasonable for that. And since this is a dollar, if you times it by 2, it would be \$2.

>> Right.

>> Since it's 1,300 millilitres, 790 is basically 2 – twice this. So if you add 340 again to that, it would be 1,020 millilitres. So basically, again, you're getting a little bit more than what you asked for it.

>> Right.

>> And we decided to put it for \$3 because it's basically this times 3, which would be \$1.75 for just this much more.

>> Right.

>> And then here – a dollar for just this much more, like, compared to

those two.

>> Right.

>> And then you pay \$1.74 for this much more, which is pretty -

>> Okay.

>> Which is a ripoff, obviously, so. [laughter]

^M00:02:46

[Background Conversations]

^M00:02:57

>> Today is just we're basically, like, just refreshing them on this. So like, 340 millilitres - the cup that has -- that's 340 millilitres is \$4.25. And the cup that's 790 millilitres for so on. And then Nari [phonetic] do - which one you want to do?

>> What are you -

>> It doesn't matter.

>> Can I do -

>> Yeah.

>> I'll do that and then -

>> Nari, you do that.

>> Can somebody -

>> Sure.

>> Okay. I'll do it because I'm not doing anything.

>> Yeah. Yeah.

>> And just explain -

>> So who is explaining this one?

>> Me.

>> Okay. Then you start.

>> Now? Okay. So then I'll just do the - I'll just repeat what this

is. And I'll say this cost for like that much more. And then it'll be the same thing over here. And then just explain it with visual. And then with that explanation.

^M00:03:47

[Background Conversations]

^M00:03:49

>> Okay. So we did - we did ours a little bit differently because a lot of the other groups did the fairest price. And we sort of - like, we did the prices in a way. So.

>> Okay. So first we just put the millilitres with the price of 340 millilitres - 340 millilitre cup would be \$4.25. ^M00:04:11 A 790 millilitre cup would be \$4.99. And 1.3 litres would be \$5.99, which equals to 1,300 millilitres, which is \$5.99.

^M00:04:23

>> Okay. So then we - and I didn't - we subtracted them to, like, see how much you'd be getting. So we did 790 minus 340, and then the price \$4.99 minus \$4.25. So for 450 more millilitres, it would be 74 cents. And then here for just a visual, we approximately showed what a 790 millilitre cup would look like.

^M00:04:46

And then we showed 340 millilitre cup. And then we sort of did, like, the 400 millilitre cup - the 400 millilitres, we turned it into a cup; and we showed that you're paying 74 cents for only this much more of your drink or whatever you're - you know, you're buying.

^M00:05:02

And then also, if 450 millilitres were to be a cup size, you would be paying 74 cents for 450 millilitres; and you're paying 425 cents for just 340 millilitres. So even if it's, like, about, like, you know, a hundred millilitres more, you're paying \$3 less for 450 millilitres than you are for 340 millilitres.

^M00:05:25

>> We did the same thing again. So 1,300 minus 790 and 5.99 minus 4.99. So that's 510 for a dollar.

^M00:05:34

>> And then again, we did the same thing here, but with the 1,300 millilitres. So here we showed the 1,300 millilitre cup and then the 790 millilitre cup. And then here we showed the difference between the two. So you're paying a dollar for 510 millilitres. And so these - yeah. That's not, you know, sort of like a ripoff. You're paying \$1 for 510 millilitres more of your drink or whatever.

^M00:05:58

So again here, if, like, 510 millilitres were a cup size, you would be

paying only a dollar for it. And then you're paying almost \$5 for 790 millilitres. So your benefit is less. You're paying, like, \$4 less for 510 millilitres than you are for 790 millilitres.

^M00:06:17

>> Then 1,300 minus 340 and \$5.99 was \$4.25; so it's 960 for \$1.74.

^M00:06:26

>> And then – so again, here we have the 1,300 millilitre cup. But now we have the 340 millilitre cup. So as you can see, there's a really big difference in between the two cup sizes and the difference in 960 millilitres. So you're paying 174 cents more for 960 millilitres. And if 960 millilitres were to be a cup size, you'd be paying 174 cents -- \$1.74 for 960 millilitres. And you're paying \$4.25 for 340 millilitres. So, like, obviously, you can see the difference is really big. And you're paying, like, about \$3 more for this cup size that's smaller.

^M00:07:05

>> So we think that a reasonable price for 340 millilitres is \$1 and \$2 for 790 millilitres and \$3 for 1.3 litres. 340 millilitres should be \$1 because it's pretty small compared to the other sizes. And if you estimate 340 times 2, you get a number close to 790. So we decided since it's almost double this size, a reasonable price would also be double, which is \$2.

^M00:07:35

>> For 1.3 litres, which is 1,300 millilitres, we think a reasonable price would be \$3 because, again, using the information above, 340 millilitres times 3 is approximately 1,300 millilitres. ^M00:07:49 So we thought that tripling the price would be reasonable. And so in conclusion, we think that the large cup is the fairest price because you're getting the most for what you're paying for.

^M00:08:00

[Applause]

^M00:08:03

>> I guess the newest – the new thing in this strategy was visualizing the differences between them. I liked it a lot because it gave us – there's a lot of comparisons happening right there. And all your conclusions are great. And the way you explained in the end how you decided what's fair, that was great.

^M00:08:21

Grade 8 Group H- Glimpses of Solving the Movie Theatre Problem

[Inaudible background conversations]

^M00:00:08

>> I think using per dollar as your unit rate I think is going to work really well. So 80 per dollar.

>> Is that a lot or?

>> No. In the initial hypothesis was it's twice as expensive because twice the size cup. Now look at 80 compared to 158.

>> [Inaudible]

>> Yeah.

>> Way of thinking about it. So the one that I liked a lot was the millilitres per dollar. So already they know that you get 2.17 for the largest one, 1.58 for the middle, and .80 for the small. They're very friendly numbers. But also we've got the price per litre which I think is fantastic as well. It's really, really going to prove the point. I feel like you have enough to prove the point twice over which is amazing. Like double proof, you know? You just have to fully develop your thinking. It's really, really great.

^M00:01:02

[Inaudible background conversations]

^M00:01:13

>> Decently priced.

>> [Inaudible]

>> Yeah decently priced and then--

>> [Inaudible]

>> With our formulas and information, we have concluded that the, that the biggest, oh no not W.

>> That the large size cup is the--

>> Is the best price--

>> Is the fairest price?

>> Yeah is the fairest price--

>> If you want to buy a --

>> [Inaudible] large size?

>> Yes.

>> That the larger--

>> Large size cup.

>> Yes.

>> Large size cup.

^M00:01:39

[Inaudible background conversations]

^M00:01:46

>> Is the fairest price if you are looking to buy a drink.

>> So what's your definition of fair?

>> Best bargain.

>> Cheapest.

>> Probably the cheapest. Yeah.

>> And you get the, you get what you pay for.

>> [Inaudible] price if you want to buy a drink?

>> Yeah.

>> I'll highlight this. Or you can highlight.
>> Seriously?
>> Yeah.
^M00:02:09
[Inaudible background conversations]
^M00:02:15
>> I might use them for my tweets or for my evidence.
>> So, should I write the smallest three times?
>> Yes. It's almost.
>> I did the small times four to get the closest to 1.3 but it was exactly and I did a medium times two to get it close possible. So then I found that like for \$6 here--
>> Yeah.
>> and if you buy four small cups you'll get the equivalent to one large cup, but you have to pay \$17 and here's just \$6 which is almost like three times more.
>> Whoa.
^M00:02:43
[Inaudible background conversations]
^M00:02:53
>> [Inaudible]
>> Yeah so we multiplied this times four--
>> Yeah.
>> to get closest to this one, and we multiplied this by two to get close to this.
>> Yes. And then let me show you this. This [inaudible]
>> [Inaudible] medium size and that's a fair price.
>> [Inaudible]
>> No he's saying this and he's saying [inaudible].
>> [Inaudible]
>> What's Justin doing?
>> Justin's doing title and [inaudible].
>> Okay so we were wondering what's a fair price for each cup size. So the formula we came up with was millilitres divided by price which equals millilitres per one dollar. And for example, for the small cup 340 millilitres divided by \$4.25 which is the price, it gave us 80 millilitres. So for each dollar you get 80 millilitres for the small cup.
>> Which is the biggest rip off ever.
>> Okay we also did it for the medium. So we did 790 millilitres divided by \$4.99 which is the price. And for each dollar we got 158 millilitres.
>> Which is a fair price.
>> And for the large we did the same thing. So 1.3 litres divided by \$5.99 and that equaled 217 millilitres. So for each dollar you get 217 millilitres.
>> Fairest price.
>> So for the large, we had another method to do it. So for the larger it was 1.3 litres and it costed \$6 and you can't shrink that down so we did that for the rest as well.

>> So then we decide to multiply the small by four which equaled exactly 1.3 litres and if you buy four smalls instead of one large you would have to pay \$17. And for the medium we did the same thing. We multiplied it by two instead to get as close as 1.3 litres as possible and it came up to be 1.5 and we had to pay \$10 which is like \$4 more expensive than the large.

>> So with all this information we concluded that the large cup size is probably the best if you want to buy a drink and we also found out that the small is four times more expensive than the large.

^M00:05:17

[Applause]

^M00:05:21

>> The thing I noticed most when you were doing it was you proved it in two ways, so you're really, really sure. And those two ways were two different rates. But then in the bottom right hand example was more using the cup size as a unit because in my head I was thinking logically speaking you could use the price per litre, but none of them was exactly a litre so you used the cups themselves as the units and I thought that was a great strategy.

^E00:05:49

Grade 7 Group I- Glimpses of Solving the Vending Machine Problem

>> Okay so should we start with all the prices and the weight of the bags?
>> Yeah.
>> Okay so--
>> One sec, one sec.
>> Each bag weighs--
>> Here it is, here it is.
>> 32 grams.
>> Yup, 32. [Inaudible] price, 32 grams.
>> No just chips because they weigh the chips.
>> Okay.
>> Okay so, and each costs--
>> Usually like each
>> Yeah it's one thing.
>> So like just say like one bag of chips.
>> Say one bag of chips equal [inaudible] price.
>> Okay so one--
>> Okay so now we need to calculate so how much, how many grams are in a kilogram which is, a kilogram is 1,000.
>> Um hum.
>> So 30, 1,000 divided by 32 so we can find out how many [inaudible]--
>> See if it has a calculator.
>> Just to speed us -
>> Okay so--
>> 1,000 divided by 32.
>> Yup.
>> 31.25. That means 31 and a quarter which would mean--
>> [Inaudible]
>> Yeah it'd be 25 cents.
>> Wait, what? Fair price would be 44 cents?
>> 44 cents, yup.
>> Okay so 44 cents?
>> [Inaudible] 44. Okay so next is--
>> Oh you want to do the explanation?
^M00:01:44
[Inaudible background conversation]
^M00:02:05
>> Okay so then--
>> First--
>> just tell me the operation to do.
>> we did 300 divided by 1.5.
>> Divide by, yeah by 32 plus [inaudible].
>> So in the question each bag of chips costed \$1.50 and weighed 32 grams.
>> And we searched up some family, the weight and size and the cost of some family sized bags online and each family sized bag weighed 300 grams costing \$4.10.

>> So after that we decided to do 300 divided by 32 which would give us how many small bags would go into a big bag.

>> And then after that we took that number of how many small bags would fit into one big bag and then we multiplied it by the cost of one small bag which equaled about \$14. And then if you were to get the amount of grams of, with the price of the small bags into one large family sized bag, that would be almost \$10 more. You would be paying \$10 for what you could get for \$4.

>> After that we did like trial and error. We tried to get like the exact number of how much it would be fair to buy the bag for.

>> So then yeah after repeated trial and error we got to 44 cents as a fair price for the vending machine sized bags.

>> And it, 44 cents if we were to multiply it by the number of bags that would go into a large family bag we got \$4.10 , 12 cents, which is as close as we could get to \$4.10. So we decided that 44 cents is the fairest price for, to buy a small bag of chips at the vending machine.

>> Excellent.

^M00:04:26

[Applause]

^M00:04:29

>> For, just one second. For this class I think I'm just going to ask one question for each because we're always working with the clock, and my question is this, what explains the difference between 1.50 and 44 cents? Why is it? Why is there such a wide price difference between what you think is fair and what it is in the vending machine?

>> Well we thought, we sort of thought about it and we think like they might have costed \$1.50 because like shipping and handling and then they have to open the vending machine and put all the bags in again.

>> Yeah. A person does that for sure.

>> So they would like, they would take the money to try to pay the guys that like open it and yeah.

>> Okay.

>> And also we used a different frame of reference which was the family sized bags which everyone would use a different frame of reference to find what would be a fair price. So you, when we use this it would cha- like a lot of people used different frames of reference so everyone's answers would be a little bit different.

>> Yeah this is an absolutely brilliant observation. Everyone's frame of reference was very different because we looked at all six yesterday and it's just amazing.

^E00:05:48

Grade 7 Group J- Glimpses of Solving the Vending Machine Problem

>> [Background conversations] We can divide, we can divide one kilogram by [inaudible].

>> Yeah, we could do that, or we could multiply. It's the same thing. It's just--

>> Yeah, yeah, okay.

>> So we could--

>> It's really not that hard.

>> Yeah, and then all we need to do is just multiply by the same amount, or divide.

>> Divide--

>> No, you can divide. You can divide.

>> You multiply, you're making it bigger.

>> You just change the division sign--to division.

>> You've listed information you have--

>> And now we're going to have what we did.

>> Yep.

>> No [inaudible].

>> Okay so our goal is to find the price per kilogram, maybe, I'll just ask as you do it, how are you going to calculate price per kilogram?

>> We're going to like--

>> We have it already.

>> Yeah, it's 31 point--

>> One kilogram divided by 32, divided by grams, we're going to get whatever the answer is?

>> So if you divide kilogram by something kilograms, by something in grams, is that a dollar value?

>> Oh no, then we're going to take the money and we're going to

multiply it.

>> Alright, you know where you're going, and I think it's going to work.

>> That's 1,000 grams divided by 32.

>> Oh, I did.

>> Yeah, yeah, it's the same thing.

>> Okay so I'll write it there. Dude, you can write it.

>> No, we need to write how many little bags a kilogram would be.

^M00:01:17

[Multiple Speakers]

^M00:01:20

>> I think fair is like, when like, it's good for both sides. Right?

>> It would be more fair to us because--

>> You want it to be better for us because the chip companies and all these other companies, they can get money from other places.

>> Yeah, but we all want it to be fair for us. So they have also more money, so then they could control the prices--

>> So we want more for our like money I guess.

>> Maybe compare it to a bigger size of chips.

>> Or compare it to like--

>> Or for example if they give racks, a pack of chips, for like \$4, except it's like around like 500 grams of chips in it.

>> Yeah.

>> And the small ones would have one--

>> 32.

>> No, well 32, not even, yeah, 32. And those are \$1.50.

>> So I don't get how that adds up from \$1.50, we should, you know-- I'm just elaborating. So you get \$1.50, change it to \$4, how would you get like, 400 more grams?

>> Exactly. So it should be fair to us.

>> Yeah, like why are they giving us only 32 grams for \$1.50, then all of a sudden giving us 500 for \$4? Or we could either make it cheaper, or we can get more grams.

>> It's like how many of these bags would be the big one, and then you think like, say there's like--

>> Yeah, but then there's like maybe 100, no, 150.

>> What is it. I think it might be 580--

^M00:02:51

[Multiple Speakers]

^M00:02:54

>> 580? How did you get 580?

>> Well no, no, no, I think that's the size of the big chips.

>> No just curious how you knew that?

>> Oh why don't we just go--

>> Because I eat a lot of chips?

>> [Laughter] It's like this, why don't we just look online--?

>> Okay. It's 18 point--

>> Good idea.

>> That's a lot.

>> Okay.

>> You can like--so we know like this is how much of these are in that? So you can maybe divide the price of this so that this number and that will show a fair price for this because if we multiply \$1.50, times this number, it would be more than--

>> In dollars?

>> And these bags are not \$30.

>> Does that make sense?

>> Okay, so I'm looking online, and a sharing bag of Doritos is 200 grams.

>> It is?

>> Yeah.

>> Family size?

>> No, a family size bag of Doritos is 17 ounces, which, I don't know how much that is.

>> Is that ounces?

>> Yeah.

>> I don't know how much else is, I think there's an app here for converting.

>> [Background conversations] So how much is a Dorito--?

>> 17 ounces is about 481, or 482 grams.

>> Okay.

>> So yeah.

>> So 32 times--

>> Is that 32, or do you want me to--

^M00:04:34

[Silence]

^M00:04:40

>> Well I was saying that like you get all these small bags, and multiplied by how many of them are in the big bag, it would cost a lot more than one of these, even if it's the same amount of chips.

>> So how did you find out how much that they cost?

>> Well we can take 150 and then multiply it by--

^M00:04:57

[Multiple Speakers]

^M00:05:01

>> Multiply by 25, multiply by--

>> 15.

>> 15.

>> It's \$22. See you have \$22 and a half dollars, so that is, so that's so unfair because--

>> It's a rip off.

>> I know.

>> Because the real price of the family size bag is--

^M00:05:18

[Multiple Speakers]

^M00:05:21

>> It's like \$4 or \$5.

>> Yeah, so we just--so then that doesn't make sense.

>> But then you're buying 15 of each, they're paying \$22 when they could just buy one family size and pay \$4.

>> Maybe they could just have, like--you know those popcorn boxes?

>> Yeah.

>> Just have that for chips.

>> Yeah, right.

>> Those were--

>> The Doritos family pack would be 3.67, and then 22.5 times 3.67.

>> Divide.

>> Would it be better to get the family pack?

>> More.

>> Yeah.

>> These both are the same thing, it's the same thing.

>> They're the same.

>> They have the same amount of chips, but this is--

>> More, more expensive.

>> This is just when you multiplied, if you buy 15 of like the normal chips, that's what you get. You get \$22, but if you just take a family size, it's \$3 or \$4.

>> First we started with how many grams equals a kilogram, and then we multiplied it by how many grams are in a bag, and how much the price was. So we started off with what we know. So what we know is that one bag is 32 grams, the price of each bag slash unit is \$1.50, and 1,000 grams is a kilogram.

>> Our goal was to find how much one kilogram would be, like how many little bags would be in one kilogram, and yeah.

>> So 1,000--1,000 grams divided by 32 grams, which is the amount of the quantity of one bag would be 31.25, so that's how many bags per kilogram, and 1.50 times 31.25 is 46.87, which is the amount of money one gram--what's that say one gram?

>> Kilogram.

>> One kilogram, that's supposed to be one kilogram, of small bags would be--

>> Over here I also found how much one kilogram of a Doritos family size would be. So I multiplied the family size times two, which gave me 964 grams, which is almost one kilogram, and then I multiplied the price times two, which gave me \$7.34. So that would be the price of one kilogram would be a little bit more than that. And then I divided the price of one kilogram of the small bags, divided by the price of one kilogram of the family size, and that gave me 6.4, so that means that one kilogram of the small bags is a little bit less than 6.4 times bigger than one kilogram of the family size.

>> Over here, what we did was we took the family size amount of grams in a Doritos bag, and we found out that if we divided 482 grams, like 32 grams which is the amount in one bag, we found that there was 15 small bags in one giant family sized Doritos. And we took into account the price of the family sized Doritos, which is \$3.67, so we took one dollar fifty which is the price for one bag, and we multiplied it by 15, because that was how many small bags are in a family sized Doritos bag, and we got \$22.50, so that's basically the price if all the small bags, if we put--if we multiplied it by 15, which is the amount of small bag you'd need to get the same amount of grams as a family size, and then we took that and we tried to divide it by the actual price of a family sized bag, which is \$3.67, and we found out that that was about 6.13 times less or more than it should be, so that means that if you buy 15 bags from the vending machine using \$1.50, you'd be paying \$22.50, which is six times more than if you just paid \$3.67 at the store or somewhere else.

>> So we divided the small bags into a family sized bag, and then in reality you're actually paying six times more. So we found the fair price would be 25 cents for each bag. Yeah.

>> We found this because since we know that one family size is 15 times bigger than the small size, we divided that price by 15, which gave us 25.

>> Now, like we know that 25 seems a bit small, but later on, when you add it all up, it really becomes a large number because how big

vending machines are, in like all these cities, and how much, like profit the chips companies get, and also we think that maybe if the company didn't think that this was reasonable enough, even though we have a lot of facts to show that, we think that maybe 50 cents or 75 cents would be good, just to give them some more like, yeah. Yeah, profit.

^M00:11:02

[Applause]

^M00:11:06

>> I guess I'd say that proceeding from the things that you know and making a list of them is always great, but having a goal, in this case how much per kilogram, helped you to select what computations you wanted to do or what tools or strategies, so what's nice about this one, it reads really, really nicely. It's really clearly laid out and easy to read. But it's a powerful conclusion that it's six times more expensive. So we already have 25 cents, 44 cents, and \$1.25. Quite a range of answers, with lots of justifications and different frames of reference.

^M00:11:49

[Silence]

^E00:11:55

Grade 7 Group K- Glimpses of Solving the Vending Machine Problem

[Background Conversations]

^M00:00:06

>> Yeah, it's on Twitter!

>> I found it!

>> Did you?

>> Uh--yeah.

>> Yes.

>> I'll tell [inaudible].

>> Yeah.

^M00:00:19

[Background Conversations]

^M00:00:30

>> If 32 grams is one dollar, fifty.

>> Here like five cents.

>> 14 grams.

>> First let's divide.

>> First we have to look at dividing. We have to look at how many grams -

>> So divide 32 by one? What's the question?

>> What's the fair trade?

>> Yes.

^M00:00:54

[Multiple Speakers]

^M00:00:58

>> Thirty two grams.

>> Grams equals zero--

^M00:01:04

[Multiple Speakers]

^M00:01:16

>> How many little bags would that be?

>> One?

>> Yeah, what does that mean?

>> That would be one. That would be one gram. I mean, one bag.

>> [Background conversations] Wait, are they just talking about one, like--?

>> Price per kilogram, you've got that.

>> Oh wait. Right.

>> Oh, the price now.

>> Fair price should be five, oh that would be one--

>> What's the price per?

^M00:01:52
[Silence]
^M00:01:57

>> No, they're talking about this is the number of--

>> I know, but that's too many.

>> Yeah.

>> Okay so what do you think, if it doesn't make sense? If it's too many bags, what do you need to do with your calculations here?

>> Divide.

>> Is that what we're doing though?

>> Yeah.

>> Right here.

>> Is this necessary?

>> This is very confusing.

>> Okay. Let me see.

>> Okay [paper rustling].

^M00:02:26
[Background Conversations]
^M00:02:35

>> Yeah.

>> Okay.

>> Can I just ask a question, where'd you get the thousand from?

>> A thousand grams.

>> A thousand grams?

>> We got it from one kilogram.

>> You got it from one kilogram, and then what's the other number? No sorry this one here, what is that in?

>> That's--

>> That's 32 grams in kilograms.

>> Okay so what are you dividing then? You're dividing grams by grams or kilograms by grams?

>> Grams by grams.

>> Oh, yeah.

>> So should we do this divided by that?

^M00:03:16
[Multiple Speakers]
^M00:03:24

>> Well all of that, was that--?

>> Thirty-two plus, no divided by one-thousand.

>> One thousand divided by kilograms--

>> It's the same thing.

>> The one bag?

>> There's no--that's grams and--

>> They're not supposed to be zero because there's no, it's not supposed to be zero.

>> You did one hundred.

>> That's--is that different?

>> Thirty-one, point two fifty.

>> Two, five. Point five.

>> How do I make that--

>> Thirty-one bags would be--

^M00:04:02

[Multiple Speakers]

^M00:04:04

>> About thirty one bags.

>> Yeah.

>> That makes more sense than thirty one thousand bags [laughter].

>> So what are you actually trying to calculate right at this moment?

>> How many bags.

>> Okay, does this number make sense?

>> No. Because you won't divide a bag, in quarters.

>> So forgetting that, you wouldn't. You'd buy either thirty one or thirty two. Is thirty one reasonable if you look at your number of grams?

^M00:04:32

[Multiple Speakers]

^M00:04:35

>> If the calculator is here, why don't we--now we've done one operation, let's do the opposite to check.

>> Oh, like--oh!

>> What can you multiply by to check? You know it's--

>> Five, zero.

>> Making sense of what the inputs wanted, input into a calculator.

^M00:04:55

[Silence]

^E00:05:03

Grade 7- Group L - Glimpses of Solving the Vending Machine Problem

>> [Multiple voices] I don't know.

>> Are you lost?

>> So, is this by-

>> Yeah, I know.

^M00:00:10

[Background voices]

^M00:00:13

>> How much, how many grams [multiple voices]?

>> So, as in, if we estimate about, like, 20, 15, 20, 25, right?

>> 20. Around, around that range.

>> Yeah, so.

>> I agree. Or just say 15 for now.

>> So, okay. So, divide 15 from 20. No, let's see. 17.5 divided by 150. 150 divided by 17.5.

>> Okay, so, just say that again.

>> 1 point.

>> Just say that again?

>> Yeah. 150.

>> 150.

>> 1, 5, 0.

>> Divided by 17.5.

>> 17, 1.

>> I've got 8.5.

>> 8 point.

>> 8.5.

>> Okay, so that's about 8.5 cents.

>> Per chip.

>> Yeah, so now we're going to try to check, like, the manufacturing cost or how much it costs-

>> Oh, okay.

>> To, like-

>> So, you're going to do some research too?

>> Yeah.

>> That's great.

>> My hypothesis, I'm looking at it and thinking that's a lot for 1 chip.

>> Yeah, that's like-

>> Your estimate per bag is interesting. I totally agree it wouldn't be more than 15 to 20 in 1 of those little bags.

>> So, the, 1 potato is worth.

>> 30 cents?

>> You could probably Buy a potato for 30 cents. I wonder how much, thIS company can buy it for?

>> Google search average price, like, in a store. We need to go in a store.

^M00:01:43

[Background voices]

^M00:01:48

>> So, average-

>> If you sold, like, almost, if you sold 4 chips, that would be more than enough to make 1 bag at the factory.

>> Yeah, okay.

>> Yeah, yeah.

>> So, now that we have 156.2 bags for the price of 31 in the vending machines, that's like a big difference, you know what I mean?

>> From the factory?

>> Yeah, like, if a factory can make almost, like, 160 bags for what we buy 31 bags, like, the price, you know?

>> Yeah.

>> Yes.

>> That's like a big difference.

>> So, I think if we do it by 100, like, 100.

>> Bags. We must find a reason for the big difference.

>> Okay, so what's in, that's 3,000, 3,000 plus 3,000 plus 3,000, how many times is that?

>> That's 4.

>> Oh, okay. What if we do it, like, you know how 15 is a multiple of 3, right?

>> Yes.

>> Yeah, we can buy 500 bags for that much.

>> So, let's send 500 bags, bags at 500.

>> But then again, they're trying to make money anyway.

>> Yes.

>> Of course it would be more expensive.

^M00:03:10

[Background voices]

^M00:03:19

>> Okay, so if we buy, that's like a 5 times increasement.

>> Yeah.

>> So, 150 cents, like, divided by 5. So, that, it should be 30 cents at the factory, plus/minus a few cents. Yeah, it should be around 65 cents.

>> Yes.

>> Do we think that 65 cents is a reasonable price?

>> Cents. After, like, we did our research and stuff, we figured out that 30 cent, like, the manufacturing company makes 30 cents just to make 1 bag of chips, but they sell it to us for \$1.50. So, we took, like, a easy example of 100 bags at the factory and 100 bags at the vending machine and turned out that they can make 500 bags of chips for the money that we buy for 100.

>> I just, like, like, like I just feel like it's 30 cent per bag, like, you know? So then, like, so that's why we did 65 cents because, like, because you can make 5 bags for the price of 1 and, yeah. That's it.

>> You can buy, like, 500 bags at like the factor price instead of here, here. Like where you can buy only 100 bags at the same price. The price'll be the same except this 1 you can by 500 bags.

>> And at the factory, like, you can make 156 bags for the price of 31 bags in the vending machine. So, it's like-

>> [Multiple voices] worth that.

>> It's about, like, 5, 6 times more.

>> Yeah, about 5 or 6.

>> So, how does that make you feel?

>> Ripped off.

>> Ripped off.

>> It's overpriced.

>> Way overpriced.

>> Like, the factory people can eat a lot more because you can add 3 and a half chips while the factory makes 1 chip. So, yeah.

>> And, like I said, and since we figured out that there's about 17 and a half chips in every bag and then we divided it by \$1.50 or 150 cents, and it got us to 8.5 cents per chip.

>> Wow.

>> so, as in, think about it. Like, 8.5 cents is, you wouldn't think of it as a lot but that's almost, like, 1 dime for something that you can eat in 1 bite and forget about it the next second. And then, like, we also saw that in the factory, you make 3 and a half chips for every 1 chip that they sell in the vending machine. So, you're kind

of thinking about it and you're like, should I really be buying this.

>> I've bought a few chips at the vending machine before and my parents are always saying, "\$1.50 is kind of overpriced. Like, I could get you more at Walmart or something for a much cheaper price than that and get a lot more." That's why I don't buy it from the vending machine anymore.

>> The question was what is a fair price for a, like a small bag of chips in the vending machine.

>> All right. So, we started off by doing some research on the internet about how much does the manufacture 1 bag. We found out at the factory it takes 30 cents to make 1 bag of chips. It's the same thing at the vending machine, which would be \$1, \$1.50 at the vending machine. So, we also did some more research and we found out that it's about 17.5 chips in 1 bag. So, we divided \$1.50 divided by 17.5 and we got 8.5 cents per chips at the vending machine.

>> So, now, since we don't exactly understand how 8.5 cents could be related to a fair price, so we took the most common value, considered as 1, or 100 percent. So, 100 times 30 cents is 3,000 or \$30.00 for 100 bags of chips at the factory. But we get the same 100 bags of chips for 150 dollars at the vending machine.

>> Yeah, so 3 times 5 is 15. So, we're paying 5 times more at the vending machine than the, than they do at the factory. So, yeah, we did that easy example and as you can tell, 100 bags of chips is quite expensive here than it is at the factory. So, the factory could make 500 bags for the exact same amount of money that we pay for 100 at the vending machine.

>> So, then, as we had another subquestion, per se, for how many bags are in a kilogram and how much it would cost, we found that there were 31 bags in a kilogram of potato chips or small bags of chips. So, at the machine, 31 bags would cost, like, around \$50 or to be precise, \$46. and at the factory, it only takes them \$9 to make a kilogram of chips, which is a \$37 difference

>> So, the fair price that we chose was 65 cents. Now, you might think that's a little underpriced but, you know, I'm not expecting stores to actually use that amount, but if you think about it, this is pretty reasonable for the price you pay.

>> So, like, as in back to that 1 kilogram example, it's like most of you, for example, you buy 31 bags of chips in a year or whatever if you go to the vending machine pretty regularly. But if you're spending \$46, basically \$50, you could buy, for example, a new video game or, like, something else that you might like but you're not noticing that you're using that much money because oh, look, it's a

bag of chips, it's 100, it's \$1.50.

>> And also lots of people buy family-size bag of chips. When you think about, when you buy a family bag of chips, I wouldn't call it family sized because only half of it's actually full. The other half is just empty.

>> And that's basically all we found here. So, yeah [applause].

>> Oh, it could be its own inquiry project on its own, maybe starting from the price of potatoes. The basic input into this product is the potato. So, not much else. So, it's, it's really interesting to start from that as, as a frame of reference, the humble potato. Which is a pretty cheap commodity, as you noticed. Also, a good point about how \$1.50 here and there adds up. Remember that when it's time to budget. Remember that when you have a house and it's time to budget for everything.

^M00:10:17

Grade 7 Group M- Glimpses of Solving the vending Machine Problem

^M00:00:05

>> Chips are a better deal compared to the other things in the machine? That's an interesting idea. Just write what the other types of things cost. Anything at all that tells us why, initially you said maybe \$1.25. ^M00:00:17 So, why \$1.25 and not \$1.00?

^M00:00:20

>> Because that would be four.

^M00:00:21

>> [Multiple Speakers] \$1.25 because apparently ^M00:00:24 [multiple speakers] chips weigh a lot less and have a lot less quantity.

>> OK. OK.

^M00:00:28

>> If it's more expensive than the candy then it's not exactly [inaudible].

>> OK.

^M00:00:32

>> And \$1.00 is too cheap.

>> Oh, like big candy would be, OK.

^M00:00:36

>> I have to write this down.

>> OK.

>> Comparing the chips to the candy.

>> The small candy, is it really, really small?

^M00:00:41

>> Not really.

>> Like a lot less than 32 grams?

>> It's like.

>> It's tiny right? OK.

^M00:00:45

>> OK. So, comparing [multiple speakers].

>> Do you have maybe final conclusions then?

^M00:00:50

>> Like \$1.00 would be too small and \$1.50 would be too big. So, \$1.25 is literally the exact middle.

^M00:00:55

>> OK. So, comparing the chips with the candy.

>> Comparing the chips with the candy, the chips should not be as expensive, ^M00:01:03 OK, put like a line there. The chips should not be as expensive because they have less quantity and they weigh less. ^M00:01:11 The candy is heavier and has more quantity.

>> Wait.

^M00:01:17 >> So.

>> Since they have -

^M00:01:20

>> It doesn't make sense for the chips to actually, I think even the smaller candy would be more worth it than the.

>> OK. So, it says they have less quantity and?

^M00:01:29

>> And weigh less. Make it look pretty.

^M00:01:35

>> In the black?

>> Yes.

^M00:01:38

>> Colours could be pretty.

>> Would you pay for like most chips are \$1.00?

^M00:01:43

>> That's a little cheap. I don't think any company would want to sell that because it's about the, it's about the income that the income at the company can ^M00:01:50 actually make. \$1.25 is like the base.

^M00:01:54

>> Don't you feel too like [multiple speakers].

^M00:01:56

>> [Multiple Speakers] expensive for the weight and the look.

>> OK. So, too cheap.

^M00:02:00

>> Basically, finish them in less than 5 minutes.

>> Oh, yeah. That was fast.

^M00:02:03

>> So, it's basically like a little snack. It's like nothing.

^M00:02:06

>> Yeah. I have to make this more refined to make the impression of less quality.

^M00:02:12

>> It would be bad quality if it's really cheap.

^M00:02:15

>> I wanted to talk about this because they said too cheap makes the impression of less quality, and too expensive the impression of high standards. How did you come up with that idea?

^M00:02:27

>> We thought that if it's \$1.00 people are going to think that it could be sketchy or not the proper, not the proper actually manufacturer. And if it's \$1.50 then -

^M00:02:38

>> It's too expensive.

^M00:02:39

>> The company will think too highly of themselves and that they think that their product is actually worth that much money.

^M00:02:46

>> And \$1.25 is like right in the middle, so that's -

>> \$1.25 is the middle between two.

>> Yeah. So, that's better than either ^M00:02:54 because it's less worry about [multiple speakers].

>> I think [multiple speakers].

^M00:02:59

>> They are refining the price a little bit more so that it's more fair instead of too expensive and too cheap.

^M00:03:05

>> It's just like the fair price between the two. Not too expensive. Not too cheap. Just like the exact middle would be \$1.25 between the two prices that we picked that the range was.

^M00:03:14

>> But then look at the Lays chips. That, the chips are so thin, and then it's so expensive. And then for the Doritos like.

>> They're thicker.

^M00:03:23

>> Yeah.

>> It's heavier. ^M00:03:24 They are all the exact same price and they all look the same, so they're going to price them all the same, so it looks like it's all worth the same.

^M00:03:32

>> And then Cheetos as like [multiple speakers]. ^M00:03:34 So like, in my opinion, I think they should lower the Lays more.

^M00:03:40

>> Well, you couldn't say that either because it could also be that there's more in the Lays than there are in the Doritos.

^M00:03:47

>> But that's the thing too. Like the Lays, even though it's thin there's a lot of chips inside the Lays, ^M00:03:53 but as for Doritos because it's so thick it's not a lot in it, so it goes by fast [multiple speakers]. Yeah.

^M00:03:59

>> Well, I don't know. We can't exactly estimate that all of them are going to be the same weight.

^M00:04:03

>> Yeah. But the way we're doing this problem is that he showed us that they're all the exact same weight. That's what he's showing us. He's showing us that each back looks the same and is the same weight. We have to go off of what he gave us.

^M00:04:14

>> I guess, but it's not really showing us everything in the vending machine.

>> Yes.

^M00:04:20 >> In my opinion I think they should like instead of having those big lunches, I think they should do it as the nuggets where it's like the small packet and the big packet, so it wouldn't seem like.

^M00:04:28

>> Comparable prices.

>> Yeah.

>> Well, Welch's are bigger. They're like [multiple speakers] like this small.

^M00:04:34

>> But the big nuggets like they're bigger than like the small pack. They're like long, more longer. And then the small nuggets are the square kind.

^M00:04:43

>> OK. So we did ours a little bit differently than Michael and Felix. So, basically we took ideas from our group on what fair price would be, and it ranged from \$1.00 to \$1.50.

>> We also didn't use Google to look up what a fair price would be compared to the Internet. We compared it to other things that would be in the vending machine like candy and the other chip bags.

^M00:05:07

>> So, we wrote down the vending machine inventory, and we wrote down the price next to it to see if it was reasonable or unreasonable. We also took the weights of the chips, and we took our thoughts on it. So, we also thought that different types of chips had different types of weights. So, we wouldn't know if the weight was actually accurate or not and also that the candy in the vending, the same vending machine is less money, but it's more quantity than how much the chips there are.

>>We also took into account that part of a chip bag is actually mostly just air. So, the bag isn't completely full. The weight isn't actually what it looks like it could be.

^M00:05:46

>> Also, we realized the prices were incompatible because there were different ways of handling the candy and the chips differently and the way that it was bagged or the way that it was weighed. So, also we also took into account the looks of it or the quantity of it. So, we realized that there were Welch's. They were bigger. The packs were bigger, and it was less expensive than the chips were. The chips were the lightest, the least quantity, and the second most expensive thing in the vending machine. And the big candy was the smaller ones, but it was more expensive.

>>So, in the end we decided that our range was from \$1.00 to \$1.50, and we took the exact middle. We thought that that would be a fair

price if it's \$1.25 per bag.

^M00:06:34

>> And we also wrote why. So comparing the chips to the candy, the chips wouldn't be as expensive since they have less quantity and weigh less. So, we had to pick a price that was lower than the candy. And we also realized that too cheap would make the impression of less quality and quantity, and too expensive would make the impression of high standards that the company would be expecting.

^M00:07:03

[Applause]

^M00:07:05

>> Carrie and the idea, I think we had two frames of reference, how you felt about \$1.00, \$1.25, or a \$1.50. The other frame of reference because we have to use information in our environment. So, my one question though is this because I loved it, what's another situation where humans buy the middle most expensive item as opposed to the cheap or the more expensive. Can you think of one?

>> I would guess grocery shopping. Because they have different.

>> OK. Can you think of a type of product?

>> There are different companies that have different prices and different qualities. So, technically you could choose the middle one or the highest quality with the least amount of money paid.

>> Yeah. This, the reason why I noticed it is maybe is that it is a psychological phenomenon that a lot of times we pick to the middle. What do you think?

>> I think it happens in cars.

>> Yeah, it could.

>> [Multiple Speakers] cars if you buy too low expensive of a car you might think that they use cheaper products for it, but if it's too expensive it's out of your price range.

>> Cars is actually a fantastic example. Yeah. This is an interesting case study for sure. And you really hit on something though really important because as I said there's proof that we often choose the middle.

^M00:08:17

Grade 7 Group N – Glimpses of Solving the Vending Machine Problem

[Background Discussion]

^M00:00:07

>> OK. There are about 42.

>> Maybe divide it by [multiple speakers].

>> So, it'd be.

>> Yeah.

>> Yeah, one large bag of chips that cost how much?

>> \$4.09.

>> Divided. Divided by [multiple speakers].

^M00:00:26

[Silence]

^M00:00:37

[Multiple Speakers]

^M00:00:44

>> So that equals. So, 9.4. 9.4. 9.4.

>> And then what would we do with that?

>> OK. So, that means. Yeah. So, 9.4 grams. So, then [multiple speakers] which is [multiple speakers].

>> What a fair price would be.

>> No.

>> Which is [multiple speakers]. So, now, OK, so that.

>> So, there's [multiple speakers].

>> I remember these girls, it's so interesting because we're always talking about units, making sure that we're identifying what they are. So, they knew what they wanted to do. They wanted to find out how many of the small bags were in the big bag. But what they did was they went though it in grams divided by 32 grams would be 9.4 grams. So, I just said, "What are you trying to solve here? Why did you set this up?" Because once they get to the calculations they often think, OK, grams, grams, grams. Right? So, then finally they realized, oh, we're not talking about grams here. We're talking about the bags, the small bags and the bigger bags. So, that was really great. Then they were just

off to the races again.

>> That's per bag [multiple speakers].

^M00:01:57

[Background Discussion]

^M00:02:01

>> So first we found out that [multiple speakers], this so 300 grams divided by 32 is like 9.4 grams a bag, and then we multiplied by the cost of.

>> The cost of a small bag.

>> The vending machine bag and then which gave us \$14.10, which is.

>> What does that represent?

>> Like the cost of how much a family pack would cost if you were to use this, the method they used for the vending machines. So then that would mean that each family pack now is about \$4.00. And then if you were to go buy like the number of bags that could fit into the big bag then it would be \$14.00, which is like a big difference, like about \$10.00 difference, so.

>> Absolutely. That's good girls. Is that fair?

>> No.

>> So, what's your interpretation of what fair would be?

>> That maybe each vending machine bag would cost about \$0.50.

^M00:03:28

[Silence]