

Time	Speaker	
00:00:06	Ankur	OK, you can be A, I'll be B.
00:00:09	Jeff	Sarah do you (inaudible)?
	Michelle	(inaudible). Put two down-der. Three, (inaudible counting), two, two.
		(R2 puts two dice on the table next to Jeff)
	R2	K, uh, R1, should we switch people back here? (inaudible)
	Romina	Sarah, move over a little bit. I can't get my chair in.
	Jeff	Okay, (inaudible). We have this now. We gonna, we're gonna write-
		(Romina pulls out paper and holds in front of Jeff's face.)
	Jeff	Ooo, good. We're going to do ten.
	Michelle	Let me see what you have.(reaches across table)
	Jeff	No, don't give her anything. (pushes Michelle's arm back) What will they think we're doing? See, look, we're going to do ten. We're gonna copy (inaudible)-
	R1	Show me over here.
	Student	Don't ask-
00:00:50	Stephanie	This is, um, I did the probability-
	Jeff	-next one.
	Stephanie	To help figure out why player B had an advantage.
	R1	What do you think?
	Stephanie	And, player B, Player B has the more commonly rolled numbers. Um...
	R1	Can you tell me what these numbers mean over here?
	Stephanie	Alright. Okay. These are the dice numbers. Like, numbers that can be rolled on the two die, and one's not there cause you can't roll one. And these are the number of times that number 's rolled.
	R1	Okay.
	Stephanie	Um, see, um. Two is only rolled once. Three is rolled twice. Four is rolled three times.
	R1	Okay, so two is rolled how many times?
	Stephanie	Once.
	R1	Once. Okay and three is rolled? Three is rolled two times.
	Stephanie	Three is rolled twice. And four is rolled..
	R1	Three is rolled twice? Oh, this is supposed to be a two. And this (is?) supposed to be a three. OK, I see. And this is five, is rolled? Four times. And six-?
	Stephanie	Four times. Six is five times and seven is six times. There are like six combinations, like, you know.

00:01:57	R1	Oh, huh. Okay and so forth. So, why do you, who has the advantage are you saying?
	Stephanie	Um, Player B. Because player B has the more commonly rolled numbers. Even though Player A has one, um, more number, Player B still has the more commonly rolled. Like (pointing to graph), player A only has the numbers that only have, like, one combination, two combinations, n, you know? Whereas player B has the numbers with, like, the six combinations and the five combination.
	R1	OK. OK, that's it. So how did you think of doing it this way, Stephanie?
	Stephanie	Alright, well what happened was, I was playing the game with my dad ..
	R1	Mhmm.
	Stephanie	And my dad asked me what I was going to do. And I said I wasn't sure, that'd I'd prol-I have to prove that player B has more of an, like, an advantage over player A, but, I wasn't really sure if he did because player A had more numbers than player B. And he asked me how many numbers could be rolled?
	R1	Mhmm.
	Stephanie	(And?) I told him. And he asked how many times can they be rolled. And I'm like, I don't know. So he was like, why don't you show me? And so, then I made, (flips through papers) we made this.
00:03:00	R1	Oh, that's interesting, let me see. OK, tell me about this.
	Stephanie	Alright. This is another form of, this. And actually, this is harder to follow. This is the same thing, only without the dots.
	R1	OK. Explain to me what this is. That's interesting.
	Stephanie	Alright.
	R1	Do you want to sit down?
	Stephanie	Oh, sure.
	R1	Let me get you a chair. (Come on?). Come on over here, on the side, that's where I can see you.
	Stephanie	Alright. What this is, is, this is um, these are both dice. This is dice number one and this is dice number two.
	R1	Okay.
	Stephanie	Alright. Now the number two can be rolled once.
	R1	Mhm.
	Stephanie	The number three can be rolled twice.
	R1	How is that?
	Stephanie	And it shows you down here, this is, maybe, OK, the number two can be rolled once (tracing finger across paper). The number three can be, wait hold on, this one 's easier to follow. Yeah, wait here the number two can be rolled once.

00:04:04	R1	Mhmm.
	Stephanie	Number three can be rolled twice.
	R1	How are they? What are the two ways?
	Stephanie	Umm. Two and one and one and two.
	R1	Okay.
	Stephanie	The number thr--the number four can be rolled three times.
	R1	Mhmm.
	Stephanie	(The?) number five can be rolled four times.
	R1	Mhmm.
	Stephanie	Number six can be rolled five times. Number seven can be rolled six times. Number eight can be rolled five times. Number nine can be rolled four times. Number ten can be rolled three times . Number eleven can be two times, and number twelve can be rolled one time.
	R1	Okay. And you know what-which ways they could be rolled? You can tell me what they are?
	Stephanie	Yeah.
	R1	So, nine can you tell me what nine is for example?
00:04:50	Stephanie	Sure. Nine can be rolled with, wait let me show you that one on here. No okay. Nine can be rolled with six, wait, OK, six and three.
	R1	OK.
	Stephanie	Five and four.
	R1	OK.
	Stephanie	Wait, OK. I showed five and four. Four and five.
	R1	OK.
	Stephanie	And three and six. And, yeah that's it.
	R1	OK. OK, that's really neat. So, so what's your theory then about this?
	Stephanie	Well, there's a .. okay. Theory is that player two, player B, has more of an advantage even though it is a game of luck. No way you could change it so it's not a game of luck. No matter what you do, it's gonna be a game of luck.
	R1	But if you wanted to win, would you, would you want to be player A or player B?
	Stephanie	I wanna be Player B.
	R1	OK. But that, you're saying that doesn't guarantee you win?
	Stephanie	That does, it's not a sure win. It doesn't guarantee it, but it gives you a little more of a chance.
00:05:51	R1	OK. Now, it would be interesting to know about how much more. I wonder.

	Stephanie	How much more, how much... Oh. That's the other thing. Um, I played five games with my dad.
	R1	OK.
	Stephanie	And the first game, this is player B and this is player A. It was ten to nothing. And the second game it was ten to three, player B won. The third game it was nine to ten, and Player A won.
	R1	Interesting. Oh, really.
	Stephanie	The fourth, the fourth game player B won ten to five. And the fifth game player B won ten to six.
	R1	Now, does it surprise you that player A won one time here?
	Stephanie	Well it surprises, well-
	R1	But player A won one time out of five.
	Stephanie	Yeah, player B, A won-
	R1	Does it surprise you that when A won the scores were close? And when A lost the scores were far-
	Stephanie	I figured that if A was going to win the scores would be close because of the way the numbers are like together. But, but when player B won the numbers were, like, split apart, so it's weird. You don't know it's like, um, just coincidence or you know. It's like...
	R1	OK.
	Stephanie	It's not-
	R1	OK, well that's very interesting. Would you be willing to, um, write some of your summaries up on an overhead to share, and I think Michelle wants an overhead sheet too. I'm going to go listen to what Michelle is doing.
00:07:05	Stephanie	Alright.
	R1	I'll get you an overhead. Sure. I have one right here, actually. Excuse me.
	Michelle	Write with black, and blue.
	Jeff	Write certain things in blue, and certain things in black.
	Michelle	All the player A things in blue, all the player B things in black.
	R1	(during Michelle above) OK, you might want to go (inaudible).
	Jeff	OK. First, no-
	Romina	Should I write down this?
	Jeff	No, this-yeah. First, yeah, make that chart thing.
	Michelle	Put-put one, impossible.
	Jeff	Impossible. Put one, impossible. Cause it is impossible. Don't spell it wrong.
00:07:43	Romina	We started one like this last time.

	Michelle	It's two S's.
	Jeff	Yeah.
	Romina	You happy?
	Jeff	Yes. OK, for A...
	Michelle	It's (like?) a big blot of ink.
	Jeff	Two and one equals-get, use this sheet. You are, no, gimme it. I'm a, you are-
	Romina	No, I'm writing it.
	Jeff	You're nuts. Where's the other thing. Where's the black-
	Romina	I'm writing it.
	Jeff	Get outta here. You can't even spell impossible correctly.
	Romina	Jeff, no one can understand you. Nt-ha.
	Michelle	I can understand his writing.
	Romina	So can I, but (inaudible, two words?)
	Jeff	How you spell your name?
	Sarah	(inaudible)
	Jeff	N-ehh?
	?	(S?)he (asks you/has to do?) that every time.
	Michelle	She mumbles, she's like, (unintelligible). Milin 's with them now. He doesn't care about us.
	Romina	Should we explain it to somebody?
	Michelle	No.
	Jeff	Well, we'll explain it when it goes up.
	Michelle	Yeah.
	Jeff	What's two?
	Romina	Oh, let me guess who's gonna explain it. Hmm?
	Michelle	All of us.
	Romina	Mmm.
	Jeff	Mmm.
00:08:45	Romina	He doesn't let anybody explain.
	Jeff	S-standing there. (You?) weren't doing anything. What do you want me to do, just sit there and not do anything?
	Michelle	Yeah, that'd be nice (to do?).
	Romina?	(inaudible)
	Jeff	Four is two, two, one.

	Sarah	Milin moved?
	Jeff	Yep. Why couldn't he move out of town?
	Michelle	You little cheat. (Jeff laughs) How rude.
	Romina	Shelly, you moved last time.
	Jeff	You always move. So, don't say, "how rude."
	Romina	Well, so do I, but-
	Michelle	Yeah, Romina.
	Jeff	You both, you just abandon us.
	Michelle	Me, Brian, Ankur, and Shelly always work together. We can't help it.
	Jeff	Then go.
	Michelle	Five and one.
	Romina	Three, four.
	Michelle	Yeah, four and two.
	Romina	Five, two.
	Michelle	Romina, why are you doing that when he's doing it?
	Romina	Because I'm ahead of him.
	Jeff	You are?
	Romina	Yes, I am.
	Michelle	Hurry Jeff, she's on ni-she's on eight.
	Romina	I'm on eight, and you're on seven.
	Jeff	Yeah, but I look good and she looks bad.
	Romina	Hey, mine looks pretty good. Ha-ha.
	Jeff	It-(inaudible)-just-
	Michelle	You didn't spell impossible right.
	Romina	Yes, I did.
	Jeff	See, my, what does that say?
	Michelle	Yeah, and you-yeah, impossible. Her's isn't.
	Romina	I (forgot?)-
00:10:03	Jeff	Imblockable. Huh, it, imblobable.
	Michelle	It's like, all ink. And, see, he wrote the names.
	Jeff	Seven, seven, seven. Two, five.
	Romina?	You forgot the date, Jeff.
	Jeff	OK. One. Eight. What's the combinations for three, just read these to me? It's a

		lot easier.
	Michelle	OK. Eight is four, four...
	Jeff	Yeah.
	Michelle	Six, two.
	Jeff	Yeah.
	Michelle	And three, five.
	Jeff	Nine.
	Michelle	Five, four. That's it.
	Jeff	Ten.
	Michelle	Five, five, and six, four.
	Jeff	Yes.
	Michelle	Eleven is five, six, and twelve is six, six.
	Student?	And what's today's date, Ank.
	Michelle	It's the twenty-first.
	Jeff	What is it?
	Michelle	Twenty-first.
	Jeff	OK. Oh, you only put our name on it; you're talking about me being like that.
	Romina	I'm still writing the date here.
	Michelle	Let me see. Let me write my name. (grabs pen from Romina)
	Jeff	OK, so what else do we-what else are we putting? OK. Where's, I need the-gimme the blue marker real quick?
	Michelle	(inaudible word). One second.
	Romina	Black. (grabs the black marker)
	Michelle	All blob, thank you.
	Romina	I'll wait for the blue marker, so I can...
	Michelle	Gimme my pen back, please. I'm going to-stealing my pen from me.
	Jeff	Wait a sec, where's mine?
	Romina	That's my paper.
00:11:32	Michelle	Here.
	Jeff	OK. Wait-
	Michelle	(Looks at the back of Jeff's sheet) I didn't answer the questions.
	Jeff	OK. What are all the numbers with number, what's the numbers where number one can go?
	Michelle?	Um, what do you mean?

	Jeff	Player A.
	Michelle	Player A goes to two,
	Jeff	Two. Wait. OK. Well, actually, this is what I'm trying to say here. That, player A, two, that means that they have one chance at hitting two, one chance at hitting three, two chances at hitting four, two chances at hitting ten, one chance at hitting eleven, and one chance of hitting twelve. That equals eight. Then num- this part is w-with eight, it's (running?) with the other group, with player B? There's three, three, three, and two, and that's twelve. No, that's eleven.
	Michelle	But don't they get nine?
	Jeff	Yeah, I forgot about that. So, that's twelve. So that h-that's how player B has the advantage. But, it doesn't mean that player A can't win. So, how do I write that?
	Michelle	Write-write the numbers in next to it, and we'll explain it when we get up there.
	Romina	Ha-ha, I'm writing it.
	Jeff	That's good.
	Romina	Cause I already wrote it.
	Jeff	OK, so...
	Michelle	Romina, why don't you just let him finish? It's like you're in competition here writing.
	Romina	I'm not in competition, (during Jeff below) (that's ridiculous?).
	Jeff	Yes, you are.
	Romina	I just feel like writing.
	Jeff	Romina, don't try to be cool. OK. (inaudible word). Can I have the black, Romina?
	Romina	Hold on, I'm almost done.
	Jeff	Stephanie, can I borrow your green?
	Stephanie	Sure.
	Jeff	Thank you.
	Romina	Oh well. My advantage is (inaudible).
	Michelle	How could you change the game so it's (now?) fair. You know what I did? (grabs Romina's paper) OK, player A, I put player A... player B, look. Romina. I put two, three, four, five, six, seven, eight, nine, ten, eleven, and (counting) one, two, three, four, five-one, two, three, four, five-one, two, three, four, five, and the twelve is left over, so if-if, ah, if they rolled twelve, since it's so hard to get, they both get a point. Would that make sense?
	Romina	(during Michelle above) That's what I did.
00:14:23	Jeff	Sort of, but then, but then there could be ties.

	Michelle?	That's true.
	Romina	No, I got a different way.
	Jeff	Because it can be nine-nine, and if they roll, and it hits twelve, it will be ten-ten, and then you have to make a trib-tri-tie breaking round.
	Romina	Jeff, mine doesn't have just five, four.
	Jeff	(during Romina above) (Huh?). (After Romina above) What?
	Romina	Nine doesn't just have five, four.
	Jeff	Oh, it has what-cha-ma-call-it too. (Where?)-
	Michelle	Six, three.
	Jeff	Oh, that's not good. You see, you're supposed to get -
	Michelle	(starts and finishes during Jeff above) I'll go get, I'll go get a tissue so we (inaudible).
	Jeff	So, what'd you write?
	Romina	(Said?), player B has an advantage. A-"A" does have a chance of winning because B doesn't have that much of an advantage. Sounds dumb.
	Jeff	Did you have, put a little water on it?
	Michelle	No. Der.
	Jeff	So, that means play-player B has thirteen b-thirteen possible chances of hitting it? Player A only has eight.
	Michelle	(I think I got?) a little bit more than needed.
	Jeff	Well, now you're going to smudge everything up, and then (inaudible word) you. Now, get a dry tissue, (Stevie?).
	Michelle	Here. (hands Jeff a tissue)
	Jeff	That's good enough. So, that means there's also six, three.
	Michelle	Mhmm. You forgot the dash. The (inaudible) whatever you want to call it.
	Jeff	So, that means player B has thirteen possible-
	Romina	You put three.
	Jeff	No, I didn't. Chances of, hitting one of their numbers, or-
	Michelle	Of winning.
	Jeff	Of la-no, landing on, of-
	Michelle	Getting a number.
0016:49	Jeff	Of the dice landing on their number?
	Michelle	Yeah. Doesn't the blue kinda look like purple? Doesn't it?
	Jeff	Wow, just ruin hers-ruin hers.
	Michelle	There, doesn't matter.

	Jeff	OK.
	Michelle	Thanks a lot, Jeffrey.
	Jeff	Player-
	Michelle	(Ow?)
	Jeff	A-
	Michelle	Now, if you don't have enough room, you can turn it over and write on the other side. (Michelle laughs; Jeff stares)
	Jeff	Only have-
	Michelle	Just seeing if you were paying attention, Jeff.
	Jeff	Well, OK, and that's basically the story. Yeah, that (responding to Michelle's laughing)... Sarah looks pretty intrigued.
	Michelle	She's sitting there. (Michelle copies Sarah's posture)
	Jeff	One potato, two potato, three potato, four? OK.
	Michelle	How did you change your game?
	Jeff	Well-
	Michelle	Why would player A get twelve? Now he, player A, has an advantage cause he has more numbers.
	Jeff	You see...
	Romina	What?
	Jeff	It doesn't matter. How about if they hit twelve, it gets two points, and if it hits eleven, all the ones with one possible chance gets two. So, that means-
	Romina	I did it a different way, so I think it's pretty fair.
	Jeff	Two, four, six, eight, ten. That means they would have twelve, and they would have thirteen. That would make it a lot more closer. And if he gets a twelve, we'll make it three, and then it'll be, they'll both have a thir-an equal chance of hitting it.
	Michelle	OK, so, if they land any one of these, they get two points.
	Jeff	Except for twelve. Twelve, they'll get three.
	Michelle	So, that's thirteen all together, and they have the same, like, amount of chance.
	Jeff	Yeah.
00:18:45	Michelle	Yeah, but still, that one 'll be fair cause it's harder to roll those numbers.
	Jeff	How do you know?
		(Michelle picks up dice and starts rolling)
	Jeff	Four. You got one point.
	Michelle	Two.

	Jeff	No, one.
	Romina	You're only supposed to get one point, aren't you? I did this, I don't know. Cause, I got, I put two, three, four, and, like, two and three only have one possibility, so does eleven and two-well, I put player A has more because they have more of, like, the ones that only have, like, two or three. Eleven and twelve.
	Jeff	Well, if we get, look, they have-
	Michelle	I lost my (inaudible).
	Jeff	One, two, three, four, five-
	Romina	Oh, no, that's not my way.
	Jeff	-six, seven, eight, nine, ten, eleven, twelve, thirteen chances of hitting their number.
	Romina	No, I have it down here. That's how that one's supposed to be.
	Jeff	So, every time, well, they have more chances, but then, giving them more points wouldn't work though.
	Michelle	That's true. So you gotta change it some other way to-to get-(inaudible)
	Jeff	Same amount. Well, well, if we take a three away, then they'll, (then?) we have ten, and that means they'll have eleven. (inaudible) ten, and they'll have-
	Michelle	See, what if they go, like, player A gets to, player B gets twelve, and it keeps on going like that, but then you still have a number (inaudible).
	Jeff	Oh, wait, why don't we, how many, there's three that have three chances, so if you can divide them evenly, OK.
	R1	OK, when you think you have an idea (up here?), you can write it up.
	Jeff	So-
	Michelle	I think I lost my sunglasses.
	Jeff	Ah. Look. Two, three, eleven, and twelve all hit, all can be hit once. So, you give two and three to player A, and those player B. OK? Now, six, seven, and eight...
	Stephanie	Jeff, I need my green marker back.
	Jeff	Sure. (Michelle gets her the marker) Six, seven, and eight can be hit three times, right? So, that means give this to player A again (he underlines six on his paper), and, and this one to player B (he underlines eight on his paper), and this one we're not sure what we're going to do with yet(he underlines seven). Just put a little "x" next to it. Now-
00:20:55	Michelle	Let me write this down.
	Jeff	There's four with two possibilities. So, that means that there'd be four, five...
	Michelle	And then...
	Jeff	Four, five and then-

	Michelle	-nine and ten-
	Jeff	Nine and ten. But before we give them out, we still have to try to make it even with the seven that needs the three. So, what, now we just gotta find a way to make that even. (to self) Three, five... (aloud) See, it won't work no matter what you do. Neither of them will have the same amount of chances. See, if you give, like, four and seven to player A, then-
	Michelle	Let's make it how about, like, if you roll seven you have to roll again.
	Jeff	Yeah, that might work if we hit, if you roll one number you get, like, a free roll?
00:21:47	Michelle	Yeah, you (get?) to roll again.
	Jeff	And then it'll be even cause there's twenty-one different ways. If that's thirteen and that's eight, it's twenty-one. And then, one would be, uh, a roll again.
	Romina?	Player B has a little bit of an advantage.
	Jeff	No, they won't cause we'll, we'll break it up even.
	Romina	Yeah, cause eight has, like, four possibilities or something.
	Jeff	Three.
	Romina	I mean three, Jeff.
	Jeff	And then-
	Romina	And so does seven.
	Michelle	So look, we can say if you roll seven, you roll again.
	Jeff	(during Michelle above) That's why we're- (after Michelle above) Yeah, seven 'll b a roll again.
	Romina	I did, sort of, the same thing, but only with two.
	Jeff	Yeah, but two, that's only a one point. And there's-there's an even amount of-
	Romina	One point?
	Jeff	No, the-there's an even amount-yeah, like one chance of rolling it, there's an even amount, and there's an even amount of two chances hitting it, so, but there's not an even amount amount of threes, so you use six and eight, and seven 's a roll again. Make any sense? Sarah?
	Michelle	Sarah's lost, she doesn't know what we're talking about.
	Romina?	Oh, OK, I messed up.
	R1	You want to help Sarah understand?
	Jeff	Yeah, but she's not telling us she does understand or she doesn't, she's just sitting there looking at me with some stupid, silly grin. (Jeff grins back)
00:22:48	R1	You sound like a teacher Jeff.
	Jeff	Well, do you understand?
	Michelle	Do you know what we're talking about, Sarah? She's not even listening to us.

		Do you know what we've been doing?
	Jeff	Shake your head. Nod? (Sarah puts her head down)
	Sarah	No.
	Romina	No.
	Jeff	OK. Well, read the directions for the first game. (Michelle laughs)
	Sarah	I know how to play it though.
	Romina	She gets the first game.
	Michelle	This is the second game.
	Jeff	Well, that's the basis of what everything is-is on, and once she understands, make sure she understands that...
	Michelle	We're working on how to make the game better. And, see, if you listen-
	Jeff	See, look, these are all the chances of hitting these numbers.
	Michelle?	Yeah.
	Sarah	And, I got...
	Jeff	So, inste-since there's an even amount of them, a chance, chances of one, we'll spread them out. We'll give, like, two and three to player A, and eleven and twelve to player B. And then we can get-
	Michelle	You get what we're saying?
	Sarah?	(Yes?).
	Jeff	Then, four and five we can give to player A, and ten and, ten, nine and ten we can give to player B. So, that's still even.
	Michelle	Cause they both have two.
	Romina	Do you understand why we're making this game like this?
	Jeff	Now, these three have three chances. So, we're gonna, if you give six to one team and eight to one team, I mean, seven 's not going to be unfair no matter what team it's on, so we'll make seven our free roll, and you just roll again.
	Michelle	(You get?) to roll again. Do you, do you understand it? (Sarah nods yes) OK.
	Jeff	Good.
	Michelle	Maybe we should write, like...
	Jeff	Maybe we should take a new transparent and write-this is how, this is how it's based on. This is, like, what our new game is based on.
00:24:25	Michelle	Yeah.
	Jeff	Cause you're gonna all fit this on one sheet. So, if we, yeah, if she woulda had to mark it all up-
	Michelle	Yeah.

	Jeff	Romina.
	Romina	I'm sorry.
	Jeff	See, if woulda just stopped when you spelled impossible wrong, it would've been a lot easier to clean up, but no. Learn how to spell.
	Romina	Ha-ha, Jeff.
	Jeff	Bri-Brian. (What?) you looking at?
	Student	It's something Stephanie, it does make sense.
	Jeff	It looks like a pyramid.
	Romina	I had something like that, but...
	Jeff	What?
	Romina	I had something like that, but, I don't know, (inaudible) stupid.
	Jeff	Where is it?
	Romina	At home.
	Jeff	Ask her how you spell her name.
	Michelle	I know how.
	Jeff	(That won't) be fun.
	Michelle	How do you spell your name?
	Sarah	You got it right.
	Jeff	Ehh.
	Michelle	Heh-ehh.
	Jeff	OK.
	Michelle	(It's/just?) like my dad.
	Jeff	Put-put, like, ah, the new and improved game. Newly improved edition. Now with new things like flavor crystals. (Michelle laughs) Can't spell game?
	Michelle	(laughs again) Ha-ha-ha. OK.
	Jeff	Milton Bradley.
	Michelle	Ha, you want me to put that?
	Jeff	No.
	Michelle	I'll put the little MB sign. I'll write player A and player B, and write what they get.
	Jeff	OK.
	Michelle	Oops.
00:26:22	Romina	It's not written (there/like that?) Jeff.
	Jeff	I realize that.

	Romina	Duh. That's my job.
	Michelle	OK.
	Jeff	OK, player A gets two.
	Michelle	Two.
	Jeff	And eleven.
	Michelle	No, two and three.
	Jeff	No, no, but that-make it look a little better. Make it, give them two and eleven.
	Michelle	Eleven.
	Jeff	Give player B twelve.
	Michelle	Player (one?) three.
	Jeff	Of course. Now, player A gets four.
	Michelle	And nine?
	Jeff	And, yeah, nine.
	Michelle	And then, player (B?), five and ten.
	Jeff	Five and ten. Now, eight, eight is player A.
	Michelle	Eight is (player A?). And six is (whispers-player B?).
	Jeff	Six is player B, and then put seven is roll again. And this is just to even it out, it doesn't mean, it's just to even it out. Is a way-
	Michelle	Thanks a lot.
	Jeff	No, just put just a way.
	Michelle	Cool.
	Jeff	To make the game a little eve-make a game-make the game a little, little more better. Or evener.
	Michelle	To make the game a little fairer. A little more fair.
	Jeff	Yeah. (Michelle laughs) No, just put to make the game fair. And now it's just based on the rolling of the dice. (Did?) you write it?
	Romina	(inaudible)
	Jeff	No, you're writin' some-in'. (Stephanie is talking about combinations in the background) Fruit flavor combinations. In the bite-size bag of skittles. That's probably gonna be our next problem, too. How many combinations, grape-el-melon-berry? (Michelle laughs) Can we show this? (Jeff tries to attract attention) Yo. Alright, instead of making it a roll again, how about the other person gets to roll?
	Michelle	(I think you?) got it from them.
00:28:46	Romina	No, he got it from me.

	Michelle	Where? (reads Romina's paper)
	Romina	Down there. (points on her paper)
	Jeff	Well, we could either do that, (do?) we could just leave it (at?) roll again. But, then a seven might not even be rolled in the whole game. So it wouldn't make a difference. Just leave it roll again.
	Romina	(after fighting for a marker from Jeff) Can I have one of the-
	Michelle	Let's try to actually play it. How we, how we have it now.
	Jeff	OK. I'm player A.
	Michelle	OK, I'll be player B.
	Jeff	Alright. Player A, ah, will, player-how 'bout we play, like, best of five? And player A, they alternate turns?
	Michelle	OK.
	Jeff	(inaudible word) put that?
	Michelle	What?
	Jeff	Well, the, when you play it's best of five-
	Michelle	Player A and player B-
	Jeff	Alternate.
	Michelle	Alternate.
	Jeff	Because the-because it's best of five. Alternate rolling in the game. Alternate every game, rolling. (inaudible-about Michelle's spelling;both laugh). Every game.
	Michelle	In rolling?
	Jeff	In w-in rolling.
	Michelle	In rolling, for the whole game.
	Jeff	Well, you can't say that. Alternate the-OK, player A, player B... alternate-alternate what? Alternate every game in rolling. Just put it in rolling. In rolling the dice. Don't get sloppy.
	Michelle	What?
	Jeff	I said don't get sloppy. And just put, it's the best of five series.
	Michelle	It's the best of five?
	Jeff	Yeah, best of five series. (inaudible). So, just cause it has a better chance of hitting it doesn't mean it's gonna be rolled. You know. OK, now we're gonna play.
	Michelle	OK.
00:31:09	Jeff	We have a blank sheet of paper we're good. OK.
	Romina	You OK Sarah? (Sarah replies inaudibly)

	Jeff	You can copy it. OK, put game one. Player A, player B, and game one. Keep this handy in case we forget (inaudible, two words). OK. (Jeff rolls the dice)
	Michelle	Six.
	Jeff	Six.
	Romina?	Sarah.
	Michelle	So, who gets the point.
	Romina	Pick any time now.
	Jeff	A-who are you?
	Romina	Oops, wrong one.
	Michelle	I'm player B.
	Jeff	OK, then just put your name by it.
	Romina	Come on.
	Jeff	Four, A.
	Michelle	A?
	Jeff	Yep. Five.
	Michelle	Five is-
	Jeff	You.
	Michelle	Me. Five, me.
	Romina	Let's play more (inaudible-whispering to Sarah).
	Jeff	Wait, I don't see eight. Where's eight?
	Michelle	Here. It's on here.
	Jeff	Oh, OK.
	Romina	Play my way (inaudible) play my way. Do you wanna?
	Jeff	Nine.
	Michelle	Nine.
	Jeff	Is me. Five, you. Five comin' out the most. What's the chance of gettin' five?
	Romina	OK, Sarah, let's play.
	Jeff	Two.
	Michelle	Six.
	Romina	Nine. What do you wanna play?
	Jeff	Roll again.
00:32:28	Michelle	Eight. Eight is-
	Jeff	Eight is me. Seven, roll again. Nine.

	Romina	So, that's a point for me.
	Michelle	Nine is you.
	Jeff	Yep.
	Michelle	Seven, roll again.
	Jeff	We should (give it/keep it?)-we should keep track from now on how many rolled agains next game.
	Michelle	Nine is-
	Jeff	Nine is me.
	Romina	Der, you're supposed to be rolling these. (You?) Shoulda told me.
	Jeff	Five.
	Michelle	Five is-
	Romina	That's you.
	Jeff	You. Eight is me.
	Romina	Seven. Let them-the die goes to me.
	Jeff	Five (unintelligible).
	Romina	Plus one for me.
	Jeff	Six, six?
	Michelle	(Yeah?). Ten-
	Romina	That's six.
	Michelle	Me.
	Romina	That goes to you.
	Michelle	Seven.
	Jeff	Go again. Seven.
	Romina	Seven. You're roll.
	Michelle	Ten.
	Sarah	Seven.
	Jeff	Is you.
	Romina	Seven.
	Jeff	Nine.
	Romina	Seven.
	Jeff	Is me.
00:33:22	Sarah	Six.
	Romina	Six, that's-

	Jeff	Two and six. Actually, it doesn't count, it has to stay on the table.
	Michelle	Oh, OK.
	Sarah	Seven.
	Jeff	See, if it was for me, I wouldn't say.
	Romina	Ten.
	Jeff	Three.
	Romina	Me.
	Jeff	You. Did you win?
	Romina	Ten, (now?) me again.
	Michelle	Four (inaudible)...
	Romina	Five, point for you.
	Jeff	Whoo.
	Michelle	One, two, three, four, five, six, seven, eight-
	Jeff	Eight.
	Romina	Nine, go for me. (inaudible)
	Jeff	(I'm?) gonna lose.
	Romina	Ten, that goes for me.
	Michelle	Ten-
	Jeff	Nine.
	Michelle	Nine is you. Oh my god.
	Jeff	Ha.
	Michelle	This one decides. Watch it be seven.
	Jeff	Yes, of course it's gonna be a seven. Seven.
	Michelle	Seven. Watch 'em all be sevens now.
	Jeff	G-go roll a seven, so we can say it... Seven.
	Romina	(inaudible) We're not gonna have (time?).
	Jeff	Come on.
	Michelle	Ten, it's me.
	Jeff	You.
	Michelle	OK, now-
	Jeff	That's game one.
00:34:25	Romina	I won. (Sarah says something inaudible?). Oh.
	Jeff	What'd you do, stupid?

	Michelle	Ga-ga-t-
	Jeff	What are you laughin' at?
	Michelle	Don't mind me. Player A, now I'm player A.
	Jeff	No, you're player B.
	Michelle	Fine, be that way. Now I get to roll them.
	Jeff	Of course, that's what we said.
	Romina?	Three. OK, now I won?
	Jeff	Oh, way to go.
	Michelle	Jeff.
	Romina	OK. Shelly.
	Michelle	And now, keep track of how many sevens.
	Jeff	OK, put, put a little dash, and put sevens. Shh.
	Michelle	OK. Who's eight?
	Jeff	OK. Eight 's me.
	Michelle	Five.
	Romina?	Who won in your first game?
	Jeff	She did. It's you. You.
	Michelle	Four and five. Me?
	Jeff	Yep.
	Michelle	It was like this close, we rolled, we were on a tie and then we got seven twice.
	Jeff	(during Michelle above) (And a nine-?). (after Michelle above) OK, roll. Seven.
	Michelle	Seven. (One?). Three.
	Jeff	Three. You.
	Stephanie?	What are you doing?
	Romina	Nothing.
	Stephanie?	Why not?
	Jeff	Eight.
	Michelle	Eight.
	Jeff	Me.
	Student?	(l/a?) guess.
00:35:32	Michelle	It's a secret. Ten.
	Jeff	Ten.
	Michelle	That's me.

	Jeff	Yeah.
	Stephanie?	(You guys?) came up with the wrong way.
	Romina?	What's your way.
	Michelle	I rolled six.
	Romina?	Yeah, we're only on number (inaudible).
	Jeff	You.
	Michelle	Seven is roll again.
	Jeff	Seven.
	Michelle	Ten-
	Jeff	Ten is you.
	Michelle	Is me.
	Jeff	Oh, sc-l-
	Michelle	Nine is-
	Jeff	You.
	Michelle	Me.
	Student	(Jeff, don't listen?). (blocks Jeff's ears/face)
	Jeff	Seven 's gonna beat me.
	Michelle	Seven.
	Jeff	Seven 's beating me.
	Stephanie	(Yeah, this is a probability chart?).
	Romina?	I know, the one (inaudible).
	Michelle	Seven.
	Stephanie	See, she knows how to do it.
	Michelle	Twelve. What's that, me?
	Brian?	I understood it.
	Stephanie?	Bri- Brian looked at it, and he goes, what is that? So did everybody at my table, they looked at it like I'm weird. This one 's easier to follow.
	Romina	(during Stephanie above) Brian's stupid. (inaudible) Brian got it.
	Jeff	Six, you.
	Michelle	Six.
00:36:19	Brian	Steph, you wanna know somethin'?
	Stephanie	What?
	Jeff	Eight.

	Michelle	Eight.
	Jeff	Is me.
		(inaudible)
	Michelle	(inaudible) you have, four, one, two, three, four, five, six, seven, eight.
	Stephanie	No, Romina doesn't get it. This one, Brian.
	Jeff	I better-
	Romina	I get this.
	Stephanie	Yeah, Brian didn't get the hard one, and Romina does.
	Michelle	So there was-
	Romina	(That's?) cause it was the same thing.
	Michelle	Five sevens in the game.
	Jeff	So you won, you won twice in a row now.
	Romina	OK. But, how do you, how'd you change it?
	Michelle	Yeah, but it was still very close on player A and B.
	Stephanie	Alright, well, that first, Angela did a good one. Angela goes, like, different. Let me, let me show you with this chart. (inaudible) OK, player A-
	Michelle?	We (?) have to show you something.
	Stephanie	Romina, player A gets w-wait, number two, three, four, five, and six. And player B gets nine, ten, eleven, twelve, and nobody gets seven. And if you roll a seven, the other player (doesn't?) need to roll.
	Michelle	(during Stephanie above) Can I write "hi people" on this? (inaudible)
	R1	(during Stephanie above) Make sure your name is on (inaudible)
	Jeff	Now, we got this. We got sheets of paper.
	Romina	A-Angela. Where is she?
	Michelle	I just wanna write "hi people."
	Romina	I got the same way you got. To the, for the-and I didn't lie. We even played it that way.
	Michelle	Now-
	Stephanie	And, but see, I figured that there's really no way to have a sure win in the game because there, it's like, a game of luck, and so that's what I did.
	Romina	Very good, Stephanie.
	Stephanie	Oh, yeah, whatever.
00:37:37	Romina	I thought you said you didn't do any work at this (inaudible).
	Stephanie	What? I did it at my grandma's house with my dad.
	Jeff	(inaudible) Piles. (Too many/make two?) piles.

	Romina	Oh. I didn't know. What is the blank paper for?
	Michelle	OK. So, to keep, to keep track.
	Jeff	To keep score.
	Michelle	Now, let's do it as teams. So you guys know what we're doing (here/yeah?).
	Jeff	OK. Us two vs. you two.
	Romina	We sorta got our own way.
	Jeff	What was the difference between your way and our way?
	Michelle	We're supposed to work together.
	Jeff	So-
	Romina	You guys should've thought b-about that before.
	Jeff	Oh, just tell us. We, you got another set of dice.
	Romina	I know.
	Michelle	What's different between your way and our way?
	Romina	Cause when we get seven, like, player A starts rolling, but when we get seven, then, instead of just not counting it, we, like, I'll give the dice to, um, Sarah to roll cause she's player B.
	Jeff	That's what we were going to do.
	Michelle	No, see, the person who rolled seven in our group just rolls it again, and their group, they switch people. That doesn't really make a difference.
	Jeff	(during Michelle above) Yeah, they-they just switch. Yeah, but then-(after Michelle above) Does player A roll every game, and do you just play, like, one game, or is it a series? See, cause we were playing, like, a five game series, and we alternate rolling each one.
	Michelle	See, player A rolls the first game all the time, and player B rolls the second game.
	Jeff	Rolls the second game. Regardless if you roll sevens or not.
	Romina	Well, we just played one game, and...
	Jeff	Well, are you gonna play one?
	Romina	And we think it's pretty fair. Yeah.
	Jeff	Well, let's play a, with teams cause there's four people (put?) two on two your way, and then we'll put two on two our way, and then we'll decide since we're all playing, which one is better.
	Romina	It's the sa-it's practically the same thing.
00:39:20	Jeff	So, which one should we use?
	Romina	What?

	Jeff	Well, better, which one should be, like, for representing our group?
	Michelle	Maybe we should do the other one since it's already written down.
	Jeff	Yeah, that's why-that's w-we're changing (slurred word). We didn't because it was already written out.
	Romina	You guys can do your own, I don't care.
	Jeff	Which one do you like better?
	Michelle	We're getting nowhere with this.
	Jeff	How about you, Sarah?
	Sarah	What?
	Michelle	She doesn't even know what we're talking about. Which way do you like better?
	Sarah	I don't know (inaudible) because (inaudible)...
	Michelle	What?
	Sarah	They're both good, I don't know.
	Michelle	What way do you like, Romina?
	Romina	I don't know, I...
	Jeff	People. You have to have some opinion on anything.
	Michelle	Do you wanna do our way or your way? Cause if you wanna do your way, we'll use this, and you can write your own.
	Jeff	Yeah. Why don't we, why don't we keep on playing, like, in separate teams cause the, like, we'll-I'll play her again, and you play her, and you play our way, and we'll play your way?
	Romina?	Whatever you say.
	Jeff	OK.
	Michelle	OK. It's not players, it's just "a." Now, do you wanna be player B or A?
	Jeff	I like A.
	Michelle	OK.
	Jeff	Put Romina's way on top. (Right/write?), ah. (points to page)
	Romina	What are we doing?
	Jeff	You're playing our way, and we're playing your way.
	Romina	Oh. OK. We'll play.
	Michelle	So, they do it so they alternate rolling.
	Jeff	But, do you have the same numbers as us?
00:41:00	Romina	I don't know.
	Jeff	What numbers do you have?

	Romina	Well, it's sort of-
	Michelle	Maybe we should just do it separately?
	Romina	It's the same thing, but only, hold on, same thing.
	Jeff	OK, same numbers?
	Romina	It doesn't really matter. It's (not/got?), like, the same numbers, but we, I did it the same way you do. Cause you're, like, sort of, all, all (inaudible).
	Jeff	We just did it, we alternate every game.
	Romina	Twelve, two, three, eleven, four, ten-
	Jeff	Basically.
	Romina	Five, nine
	Jeff	Alright, well, let's just play against each other in each way, and then we'll both get a feel for each one.
	Romina	Hold on. Let me just write this down before I forget. Eleven, four, and nine, eight-
	Jeff	Two, eleven, four, nine, and eight.
	Romina	(Hey?) I need twelve-
	Jeff	Twelve, three, five, ten, six. I gotta right five here better.
	Romina	And seven. What do you want to be, Sarah? Player A, or player B?
	Jeff	OK. What numbers do you have? Write down her numbers here (inaudible).
	Sarah	I don't know (inaudible).
	Romina	OK. Well, we (have to play Jeff's way?).
	Jeff	What numbers do you have?
	Romina	Two, eleven, four, nine and eight. Twelve, three, five, ten, six.
	Jeff	Wait, yo.
	Michelle	Wait. OK, what does player A get?
	Jeff	OK, player-I have it. Player A, what numbers?
	Romina	Two, eleven, four, nine, eight.
	Jeff	That's us.
	Romina	No.
	Jeff	So, I was asking what are your numbers?
	Stephanie	(during Jeff above) Did I leave my chart over here? Oh, there it is.
	Romina	No.
0042:13	Jeff	You have the same numbers?
	Romina	Yes.

	Jeff	OK.
	Romina	I told you that. Yes we do. Now we do. It was the same thing. Why complicate things more?
	Jeff	OK, just, here.
	Romina?	Yeah, roll.
	Jeff	Keep it, keep the seven's thing too.
	Sarah	(inaudible)
	Romina	Yep.
	Jeff	Five.
	Michelle	Five is player B, me.
	Romina	Are we supposed to (inaudible)? (Romina and Sarah are playing inaudibly off camera)
	Jeff	No, you roll after whenever you roll a seven. Eleven. That's me. Six, you. Seven. Make it, make a thing for seven, still. Ten is you. Eight is me.
	Romina	OK, five.
	Jeff	Five is me. Nine is me.
	Romina	Ten is you. Seven.
	Jeff	Four is me. Two is me.
	Michelle	So player B doesn't always win. Cause I had a feeling.
	Jeff	Eight is me.
	Michelle	You're going to win.
	Jeff	Eight is me. How many is that?
	Michelle	One, two, three, four, five, six, seven, eight.
	Romina	(Next?)
	Jeff	No, that's for you. I was about to write it down again for you.
	Michelle	Nine.
	Jeff	Eight. Game.
	Michelle	Seven, you won. So there's one seven in the game.
	Jeff	And that's when we switched, and you rolled, and won for me. (Michelle says something unintelligible). Let's finish our series that you were in. If you win one more game, then, if you win one more game, then that means you won the series and you won the whole thing. Where's the-OK.
	Romina	Oh, I'm like (inaudible).
00:44:00	Jeff	Like, staple, you should staple these two papers together.
	Romina	Six, is mine again.

	Michelle	Why don't we just staple all our papers together?
	Sarah?	Eight, that's yours.
	Michelle	Will that be alright with you?
	Jeff	That's alright with me. Well, we'll wait 'til later cause we're not sure how many papers we're gonna use.
	Michelle	OK.
	Jeff	OK, well, what's next?
	Romina?	I won.
	Jeff	Was that a shut out? Aw, I didn't see that. It's like...
	Michelle	Player B.
	Romina	We played your way. We didn't play a series.
	Michelle	-should-we played your way, and Jeff won.
	Romina	(inaudible)
	Jeff	Yeah, OK.
	Michelle	(Is that?) the numbers I get?
	Sarah?	So now we have to play a series of five?
	Jeff	Well, we-that-that's, we're going back to our way. The, cause we're gonna finish the series.
	Romina?	Yeah, but we have to play a series of five?
	Jeff	Or seven, or any odd number you want.
	Romina?	One, two, three...
	Jeff	You don't have to write it down, I have it right here.
	Romina	Seven.
	Michelle	I know, but...
	Romina	How about you do the score this time?
	Michelle	Ten, six. (inaudible) I start rolling this time.
	Romina	Seven (inaudible).
	Michelle	Seven.
	Jeff	Alright. You're right, just make a dash.
	Michelle	Oh, der. OK, seven.
	Jeff	That's six.
	Michelle	Oh, der. Four-
00:45:12	Jeff	Four.
	Michelle	-is you. Four is you. Five is me. Calm down, Stephanie.

	Jeff	She's screaming. Eight is me.
	Romina	Five.
	Michelle	Eight is you.
	Jeff	Eight is me.
	Michelle	(inaudible)-that's me. She's like, don't start.
	Jeff	She's gonna start a fight over there. Everyone's gonna have it on camera. (Jeff makes punching motions and fake screams), I'm sorry.
	Romina	I like this(inaudible).
	Micelle	OK, I agree with your answer. I'm sorry, Steph.
	Romina?	Eleven.
	Jeff	What was it again? (Jeff makes more punching motions and fake screams)
	Michelle	Six. See, nobody listens to me, I know it. That's-Stephanie, calm down, please.
	Jeff	Wait, what's the score? Eight, it's me.
	Romina	That's eight.
	Jeff	I have eight.
	Michelle	I have six.
	Jeff	Seven. Seven. Seven. Seven.
	Michelle	Oh, sorry.
	Jeff	I don't know, right.
	Michelle	I'm fightin' with you cause I thought you were saying I had seven. I'm like, six.
	Romina	It's OK, I'm going to win the next game anyway, so, let's play again (inaudible).
	Michelle	Four is you. You need one more.
	Jeff	Five is you.
	Michelle	Five is me. Come on.
	Jeff	Now you have seven. Seven. (mocks Michelle) No, I have six. Seven.
	Romina	It doesn't matter, you have to roll anyway.
	Michelle	Six is me. Oo-oh.
	Jeff	Yep, what are you have, eight?
	Michelle	One, two, three, four, five, six, seven, eight. (There's no?)-six is me.
	Jeff	Six. Uh-oh.
	Michelle	Tie-breaker. Watch us get sevens again.
	Jeff	Eight.
00:46:50	Michelle	You won.

	Romina?	Eight.
	Michelle	That's like, the same cause you won-
	Jeff	The series is two to one.
	Michelle	OK. Player A.
	Jeff	Think we can market this game? Make money?
	Michelle	What?
	Romina	I think that was a six and a one, wasn't it?
	Michelle	Um-
	Jeff	Who'd play this game, though?
	Michelle	(I'll say, right?).
	Jeff	Would you pay, like, ten dollars to get this game? (Michelle laughs) Actually, you know what we can do? We could take all the numbers two through twelve-
	Michelle	Two to-two through seven.
	Jeff	No, listen. Two through twelve. Take all the numbers two through twelve-
	Michelle	Uh-huh.
	Jeff	And you put 'em in, like, a little bucket, and you pull every one out except, except for the seven, and that's automatic(ally/you'd?) roll again, and (pull out?)-wh-you have whatever numbers you pull out is what your numbers are.
	Michelle	We should make this game, Jeff. We'll make money, yeah.
	Jeff	Yeah. Spend more money, ah, setting it up. OK, well-
	Michelle	OK. Five is me.
	Jeff	-is you.
	Michelle	Sevens (inaudible).
	Jeff	Five is sevens?
	Romina	That's mine (inaudible) four (inaudible).
	Jeff	Eight is me.
	Sarah?	You won.
	Jeff	Eight is me. Three is you. Actually, the first time we hit a three.
	Michelle	Five is me.
	Jeff	Ten.
	Michelle	Ten is me.
	Jeff and Michelle	Twelve is me.
00:48:18	Michelle	I'm gonna have a laugh attack any second now.

	Jeff	Five is me.
	Michelle	Me. It's me.
	Jeff	I know.
	Michelle	Oh.
	Jeff	I was (like/waiting?).
	Michelle	Six is-
	Jeff	-is me.
	Michelle	It's you?
	Jeff	No, you.
	Michelle	Oh, me?
	Jeff	Yeah.
	Michelle	I don't have that written down.
	Jeff	You do.
	Michelle	One, two, three, four, five. Where's six? Who has six? We lost six. Uh-oh. Oh my god, did we forget-?
	Romina?	Player B.
	Michelle	Oh, (points to paper, inaudible, 3 words?).
	Romina?	Player B.
	Jeff	Wait, if player B has-
	Michelle	Who has six anywhere?
	Romina?	It's right there.
	Michelle	Oh, I put two instead of-k.
	Jeff	He-ha... What's that number right there? Ten?
	Michelle	Ten. What was that, me? That's you.
	Jeff	Oh my god.
	Michelle	Six is me. Ha, we don't have a six.
	Jeff	Eleven 's me. We lost the six for a minute.
	R1	I have a question, I just noticed something.
	Jeff	Yeah.
	R1	I just noticed that, uh, when Jeff was rolling his dice-
	Jeff	Yeah.
00:49:25	R1	He was taking the dice and rolling like that. (demonstrates rotating hand) And I noticed Romina was going. (demonstrates dropping hand) (There for?) (points). Does it matter?

	Jeff	No. As long as you don't just go like this. (demonstrates placing dice)
	R1	You want-
	Jeff	Yeah, you want to(,) have to move a little bit cause then you have to keep on hitting the same numbers. If you just pick them up, like, and drop them.
	R1	So, you have to have to, sort of, shake them up (then?).
	Jeff	Yeah.
	R1	OK, so it doesn't matter if you roll one and then the other, (and?) roll them twice.
	Jeff	(during R1 above) Why, you could roll-
	R1	OK.
	Michelle?	Six. We don't have a six.
	Jeff	We lost the six though.
	Romina	We don't have to play the fifth one cause (inaudible).
	Jeff	(And?).
	Michelle	(Well/and?) I don't have the six. Five is-
	Jeff	-is-
	Michelle	We don't have a five.
	Jeff	(Let me?), yes, we do. (Michelle laughs) What's the score? What's the score? What's the score?
	Michelle	Four. One, two, three, four, five, six, seven, eight, nine.
	Jeff	It's-I call a seven.
	Michelle	Three, me. I won.
	Jeff	You won the series.
	Michelle	Were there-there weren't any sevens.
	Jeff	Well, you won the series.
	Michelle	That's cool.
	Jeff	Wanna play a series against each other? See, I like this game now.
	Michelle	Cool. Players-
	Romina?	People hold on, what'd you guys, who won, like, the series or whatever?
	Jeff	She won the series.
	Michelle	Me.
	Jeff	Ah, well, what was it? Three to two?
00:50:40	Michelle	Yeah.
	Jeff	Write that down on-on one of the papers.

	Romina	What was that player A, or player B?
	Jeff	Player B won.
	Romina	Player B won here too.
	Michelle	It doesn't make a difference, player (inaudible)...
	Jeff	It's just whoever picked.
	R1	OK, are we ready to start sharing ideas?
	Jeff	I-well, we want to play one more round, and then...
	Romina	OK. You guys, you know seven, she didn't do something, I don't know, cause-
	Michelle	Three minutes, hurry.
	Jeff	Ow (Michelle cranks the pen out of his hand)-
	R1	How long does it take?
	Jeff	Ah-
	R1	Three minutes, five minutes?
	Michelle	Five minutes.
	Jeff	Five minutes.
	R1	Five minutes, we'll come together.
	Jeff	OK.
	Michelle	Jeff, Rom-
	R2	What are you saying-
	Michelle	Shelly...
	Romina	It doesn't, you guys can...
	R2	Shelly, what were you saying makes a difference? (It doesn't?).
	Michelle	For what?
	R2	What makes a difference? You said it didn't. (Has?) something made a difference?
	Michelle	About what?
	R2	About anything.
	Michelle	I don't-
	Romina	About the dice?
	R2	Yeah.
	Michelle	Oh, if you roll like this, that doesn't make it different if you roll like this. Or, or roll like-
00:51:24	Jeff	See, cause she-some-I was holding like this. I was just pick them up and dropping them-

	R2	Even if-even if you roll one-
	Jeff	Yeah, it does not matter.
	R2	And then the other.
	Michelle	That doesn't make a difference.
	Jeff	You see, see if you wanna roll one to see what you're gonna get, like, say you need a-an eleven, or whatever, if you roll a four first, or a three, you don't-you're not gonna get it cause it's impossible. So, then you could realize it's not gonna win. If you want eleven or ten.
	Michelle	So, it doesn't really matter. OK.
	R2	It just, sort of prolongs it, is that all?
	Jeff	It, forgot Sarah.
	Michelle	(inadudible)
	Romina	Shelly. Guys, you know about your sevens?
	Jeff	Yeah.
	Romina	Doe- Is, what are you guys doing? Just, if you guys just go on to, does-doesn't it have to do something?
	Jeff	We just mark them down and say that we rolled a seven.
	Michelle	OK. Four. Wait.
	Romina	Shelly.
	Michelle	What-What's our player A? Two, eleven, four, nine, eight, alright. We got the first one. Twelve-
	Jeff	That's seven. That's a seven.
	Michelle	Ah-
	Jeff	Just leave it there cause we should get at least one.
	Michelle	Twelve, (sound of door knocking) three, five, hello? Five-
	Jeff	Hello?
	Michelle	Yes. OK, we got one, seven, so far. Let's go. Seven. Nine.
	Jeff	Nine. We've got nine. They've got nine.
	Michelle	We got nine.
	Jeff	They got nine.
	Michelle	We got nine.
	Jeff	They got nine. OK, nine.
	Michelle	(points to transparency) We're nine.
	Michelle	Der.
00:52:44	Romina	Der, Jeff.

	Jeff	A five. They have five.
	Michelle	There is no five.
	Jeff	We lost the six.
	Michelle	Seven. They're all (working out/hooking up?) there for the seven.
	Jeff	Six.
	Michelle	I'm out of it. Six is them. (makes a noise)
	Romina?	What was that?
	Michelle	It's time. Four is us. We're winning. N-n. Seven. Maybe you wanna roll some time, Jeff?
	Jeff	Was that just a five and a two?
	Michelle	No, it was a five and a three. Or was it a two and a six? I don't know.
	Romina	People, I don't think we should be playing this. You guys can't even-(inaudible; group is laughing)
	Jeff	Wait, let go.
	Michelle	Come on.
	Jeff	Six. OK, six. We had six.
	Michelle	Six.
	Jeff	It was-they had six.
	Michelle	They had six. Six.
	Romina	Shelly, wouldn't it be a lot easier if you make the four a little (touches rolling dice while motioning).
	Jeff	Seven.
	Michelle	Nice going, Romina. That could've been one for us. It's us.
	Jeff	Will you stop trying to cheat? Give me those dice. Give me them.
	Romina	I paid for these dice.
	Jeff	Nine.
	Romina	They're not the same color.
	Jeff	Yes, they are.
	Romina	They're not.
	Michelle	We have eight, an you only have four.
	Jeff	Five. Seven. Eight.
	Michelle	We need one more. We won. N-n. OK.
0:54:24	Jeff	You're scary.
	Romina	Shelly, why don't you do it like, you know, like, that, like, with four lines, like

		(you're drawing all the lines in?). It's gotta be a lot easier to keep score.
	Jeff	Here, Sarah, you roll.
	Michelle	I like being sloppy. Wait, wait, wait, OK. Hold these from you. Romina-
	Romina	I'm not trying to cheat.
	Jeff	Yes, you are, Romina.
	Romina	I'm not.
	Jeff	Such a cheat.
	Michelle	Jeff, Shelly, sevens, wait.
	R1	OK. I think we will finish up what we're doing, and head to our seats.
	Jeff	Nah, forget it. We'll do it later. Who's gonna, here, give, uh, who's gonna represent us?
	Michelle	All of us.
	Romina	But we have two different ways, remember? We'd go, but (you?) came up with two different ways to play, either way (inaudible word)-
	Jeff	Yeah, but, then you should've made a thing for you.
	Michelle	Yeah, so you have to go with us. You should have made up your own thing.
	Romina	I did, but you guys started screaming at me, so I scribbled it all out.
	Michelle	You could still use it then.
	Jeff	Well, if you wanna make your own way, get a piece of transparent, and we'll do it, like, all ours and just scratch off Sarah and Romina, and you have your own way.
	Romina	(inaudible)
	Michelle	OK, we'll all go up together then.
	Romina	We're playing in a series, right?
	Michelle	OK.
	Jeff	What?
	Romina	A series.
	Jeff	Series? Yes. Series.
	Michelle	Yes.
	Jeff	Series.
	Michelle	We have to play five games to finish the series.
	Jeff	No.
	Michelle	Let's write that down.
00:55:43	Jeff	Write it down. Best of five.

	Michelle	Aw.
	Jeff	One o'clock. We're here for an hour already.
	Michelle	I didn't realize that.
	Jeff	I thought we were here only for, like, fifteen minutes.
	Romina	Weird.
	Jeff	I'm weird?
	Romina	No, it's weird. (About?) what time are we leaving?
	Jeff	I don't know.
	Michelle	When they want us to go.
		(Jeff and Michelle make noises at each other)
	Jeff	Hopefully it's like two-twenty-two. Aw, we have-
	Michelle	Then you'll have three minutes of homeroom.
	Jeff	We have Ms. Mc(Greah?).
	Romina	No, it's cancelled. Shawn mes-that's what Shawn said.
	Jeff	Yeah, that's what I thought, but... Can we go first? Like, or not, or...
	Michelle	You know when you write hi, it's like, you write the "h," and then you just turn it sideways, and you have the "i." Isn't that amazing?
	Jeff	That's pretty cool.
	Michelle	Turn this way and you got the "h."
	Jeff	Oh, (jacket?). So, you mean, if I make an "h"-
	Michelle	And then you just turn it sideways.
	Jeff	And, and then I make another "h?"
	Michelle	Yeah.
	Jeff	And I have hi?
	Romina	So, make a diagonal "h."
	Jeff	Why?
	Romina	So then, and then you can write it a second way, and that will be your special way to write hi. Because it could be an "l" or an "h."
	R1	OK.
	Jeff	Oh, that's another "i." You make an "l" over there, and you got an exclamation point.
	R1	OK. Well, there was a lot of interesting things discussed. Did you like the problem?
00:57:11	Class	Yes.

	Jeff	We're gonna market the game.
	R1	I'm interested-you're gonna market the game. That's a great idea. We have to, um, thank R2 for making that, again. My, my question is that, did you change your mind about what you originally thought?
	Students	Yes.
	R1	Yes you (inaudible-by show of hands?). But, how many of you changed your mind about what you thought after you started playing it? (inaudible-OK?)
	Michelle	I don't know, (inaudible during R2 below).
	R1	OK, so, tell me in what way that happened. Uh-
	Romina	(to group) Jeff and I thought that-
	R1	Romina.
	Romina	Well, Jeff and I thought that the game was pretty fair at first, but then when we started playing, we realized that player B had a little bit more of a-an advantage.
		(R2 shows quite a reaction during Romina above)
	Jeff	We started to break it up more into the numbers than just playing the game. And then we, sorta, got, like, we came to the-we figured out when you go inside the numbers, you find a lot more about-
	R1	Well, why do you think this led you? Anybody else think it was fair before they started playing the game? Anyone else here think so? Amy? (You want to tell?)
	Michelle	(to Jeff during R1 below) First we explain this. And then this. This is the new game, this explains why (all the?)-
	R1	What made you change your mind? (Did you?) change your mind?
	Jeff	That's, this is the basic. This is how we went inside the numbers.
	Amy	(inaudible) and those, out of the sixteen, fifteen times player B won. And player A only, player A only won once.
	R1	So that made you re-rethink it? (Amy nods yes) OK, did you have any explanation for why you changed your mind? Anybody else, what did some of you else think at the beginning? How many of you thought something else? What did you think? Yes.
	Michael?	I thought (inaudible) win because it more (inaudible).
	R1	OK, did you all hear what Mike said?
	Class	No.
	R1	Again, Mike, please.
	Michael?	I thought A was gonna win cause it has more numbers than player B.
	R1	Anybody else think that? That A was going to win? I saw some of the papers, some other people guessing A would win, but I was wondering why.

00:58:55	Michelle?	At first.
	R1	You thought so, too, Michelle?
	Student	I don't remember what I thought.
	Jeff	Really, but, like, it-it make, it's weird though because, um, player A could have two, three, four, five, six, seven, eight, nine, ten, eleven, and B can only have twelve, but B could still-has a chance to win. And that's what's weird about it. Because, like, it's just, it's however the luck is going.
	R1	O-OK, anybody else? (inaudible) you thought about it before you played the game.
	Jeff	(I?) wouldn't need much skill at this game. (unintelligible word) you need skill. This, you just have to roll the dice.
	R1	A-anybody else. Brian?
	Brian	I just knew it wasn't fair.
	R1	You knew it wasn't fair? Which way did you think it was unfair though?
	Brian	I think that player B had an advantage.
	R1	You thought player B had an advantage? Why did you think that?
	Brian	Because, just, (this is why?), this is what, not first cause I didn't really think anything at first, but then, later, like, because player A, they had, like, the first three beginning numbers, and they're hard to get because, like, the only other, like, no combinations, like, one or two, and they had the last three, which only have, like, three and two. And player B had, like, all the middle numbers, and you're, like, more combinations. So, that's what I thought.
	R1	OK, anyone else? Stephanie, what did you think?
	Stephanie	I remembered hearing, um, I don't remember what I thought, but I remembered hearing, um, a first thing, and I think I saw this too. That, um, um, player A had, had, player A had six numbers. Player A has more of an advantage. And then, when you got into it more, that player B had the better numbers to roll because as you started playing, and it's, like, wait a minute, probably player B is winning. And, it was because player B had the, like, the better-
	Jeff	Yeah, the more chances of hitting it than player A.
	Stephanie	Mhmm.
	R1	OK. Anybody else have any thoughts on that? Anyone else? Any ideas. Milin? Did you any, any theory before you started playng?
	Milin?	I thought that B would win cause they had, like, the middle numbers. Cause it's, like...
	R1	OK. Ankur?
	Ankur	Like, the same thing Brian said. Cause B had the, like, the middle numbers, and A only had, like, one, and twelve, and-I mean, like, two and twelve. And they're

		not that commonly rolled.
01:01:18	R1	Angela? Did you have any ideas before you started?
	Angela	Like, the same thing Brian said.
	R1	So you were just thinking about (it?) the way Brian was thinking about it? What about you, Matt, what do you think?
	Matt?	I th-I thought it was the same way Steph said. Like, I thought in the beginning that, you, that, player-player A has more numbers than player B. Player A 's gonna win, but then player B (always won?)-is always winning. (And, just?)...
	R1	Yeah. Magda, what did you think? Before you started playing the game.
	Magdalena?	(inaudible).
	R1	Which was?
	Magdalena?	That, I thought that player A is gonna win cause there's more numbers, but player B won.
	R1	Ah-huh. OK. Ah, Sarah? Did you have any theories before you started? (inaudible) You didn't have a theory, or did you?
	Sarah	(inaudible)
	R1	You thought it was fair at first?
	Sarah	Yeah.
	R1	Yeah. We have a lot of different things you were thinking, and I could understand that. Now I (wanna?) know, you have a theory, and now you think, if you wanted to win the game, who would you like to be?
	Class	B.
	R1	How many of you would like to be B? (class raises hands) OK, I'd like to be B also. So, now the question is, now that you've played the game, and you thought about it a little bit more, do you think you could give some insight into why (we/B?) have an advantage, and even more so, what kind of an advantage B has? Can you give some insight into the advantage of B, and even tell me a little bit more about the kind of advantage? Amy?
	Amy?	Um, I think B has the advantage cause (B?) has, like, the numbers that a lot (inaudible) dice game (inaudible) those kind of numbers that, like, twelve, or eleven, they didn't get seven or sixes. Or eights, nines.
01:03:01	R1	Why is that?
	Amy	Uh, because they have, ah, like, they have different, um, pairs that can add up to the numbers. Like, um, six: three and three, or, um, four and two.
	R1	OK, so you are telling me there are two ways you can get six: three and three, and four and two. Is that what you're telling me? (Amy's reply is inaudible) Well, three, you can get how many ways?
	Amy?	One?

	R1	OK, so Amy's telling me there's one way you can get three. And what's that way?
	Amy?	Two and one.
	R1	Amy says you can get three by two and one, one way. And she can get six by-
	Jeff	Two and four; three and three. Five and one.
	R1	Three ways. Do you all agree with that?
	Ankur?	No.
	R1	Ankur? Ankur doesn't agree with (you?).
	Jeff?	We got a chart.
	R1	OK, Milin?
	Ankur	I say, I say from three there's two and one, and one and two because two is on one die, and two is on the other die, and one is on the one die-one is also on the other die.
	Michelle	Yeah, but say you can just break the one down, and say you can switch it.
	Jeff	We're not playing with the cards anymore.
	Stephanie	What card.
	Jeff	Well, that-that's how the beginning part w-that was our second problem.
	Stephanie	Now I'm lost.
	Ankur?	Cause you can have two and one with one on (this?) side, and one on this side, or you can have one on this die, wherever it is-
	Stephanie	What Ankur said.
	Ankur	And one on this die.
	Student	There's two different ways to get it.
		(Jeff's table is whispering about this)
	Ankur	It's still the same number.
	Stephanie	Check the chart out. (hands chart to Jeff's table)
	R1	Ro-Romina, what do you think?
01:04:31	Michelle	There are different diagrams.
	Stephanie?	But, it's, like, not the same thing-
	Romina	It's like saying two plus one and one plus two. There, there's still the same
	Student	(during Romina above) Different combinations.
	Stephanie	(During Romina above) Right here. There's still the numbers on the dice you can get. And these are how many times that can come up.
	Michelle	That doesn't make a difference, the same thing. Equals the same thing.
	Student	(inaudible) -equals six. Six equals six.

	Stephanie	-the probability. And that high, that (inaudible). (and that's Bill?)
	R1	Show that up here, ah, Stephanie, so we're all-Stephanie, could you show that up here so we could all see it. And Jeff can come up.
	Jeff	I don't have to come up. That's OK.
	R1	OK. So, we have some disagreement here. Can somebody tell me what the disagreement is?
	Jeff	The-
	R1	Can someone summarize what the disagreement is?
	Michelle	The-he's saying that you have one on one die, and two on the other, but you can also have two on one die, and one on the other. But, it's the same thing. We're working with what it equals up to, not the numbers that are on the die. We're-we're working with what it equals, not what-
		(Ankur says something inaudible towards the end of this; Jeff replies)
	Jeff	Unfortunately, he makes somewhat sense because, actually, you do have two chances of hittin' it.
	Stephanie?	What?
	Jeff	See, look, because, if you roll, if this die might show a one, and this die might show a two, but next time you roll, it might be the other way around.
	Stephanie?	What, Jeff.
	Jeff	And that makes it two chances to hit that. Even though it's the same number, it's two separate things on two different die.
	Stephanie?	There's more-there's more of a chance. Therefore, there's two different ways. Therefore, there are two ways to get three.
	Jeff	(During Stephanie above) And that, like, throws a monkey wrench... (After Stephanie above) And that just screws up everything we just, sorta, like, worked on for about the last hour.
	Stephanie?	Alright. OK, what's it?
	R1	You sound like a mathematician.
	Jeff	I'm smart.
01:06:00	Stephanie	OK. What this is, is, this is my chart. Um, our chart, and that's (Bill?). And, what this is, is, um, over here, these numbers, these don't have any (times?) that these numbers, these are numbers you can roll (a lot?). Alright, and, two (comes from?) one, and I'll show you, and, it comes up one, and I'll show you this part in a minute (inaudible)-
	Jeff	(during Stephanie above) So, (what did we do to cut this stuff in half?).
		(Jeff and Romina whisper during Stephanie above)
	Jeff	(during Stephanie above) But it makes sense, unfortunately.
	Jeff	Well, then, if, couldn't two come up twice then?

	Ankur?	No, because, Jeff, one on one die, and one on the other die is still the same thing.
	Jeff	Even if you just-OK.
	Stephanie	Alright.
	Ankur	If it comes up, they're still one and one.
	Jeff	Yeah, if you do switch-
	R1	You heard that? Jeff?
	Jeff	Yeah, because, if, it just seems, like, even-even if you do switch, you'll still be, like, the same thing.
	Stephanie	Alright.
	Michelle	Yeah, but that's the same thing as that.
	Jeff	No, but this, look, on this one, you have two and one. But, you actually have to move the die to hit one and two. But, on this it doesn't-
	Student	(inaudible) you have to turn 'em (inaudible).
	Jeff	-matter. You could just, you know what I'm trying to say, here?
	Michelle	Sort of.
	Stephanie	Alright.
	Jeff	That's good.
	Stephanie	Um, for three, you can get two times, and I want to show you this graph because this'll show you how you can get it. Is-It's hard to understand, but it'll show you how you can get the number. Alright, here. One and one is two, and there's only one way to get two.
	Jeff	Mhmm.
	Stephanie	So, there's two ways to get three-
	Jeff	Didn't we have this stuff in, like, second grade? (A student responds "Yeah")
	Stephanie	And there's two threes up here because two and one is three, and one and two is three. There's three ways to get four. Three and one, and two and two, and one and three. And there's four ways to get five. Four and one, um, wait, wait, I mi-messed up. OK, four and one, three and two, two and three, and one and four. And, so on. And, seven has the highest probability. That doesn't mean seven 's gonna come up a lot because I know I rolled, I kept getting eights, and Brian kept getting four, and Amy kept rolling what she said. (class laughs)
01:08:14	Jeff	You see what-See, you, hand me the sheet, uh, this, like, the paper we worked on. Hand me it.
	Stephanie	(Starts during Jeff above) So, what happened is that this doesn't mean that your number 's gonna come up any time, but, seven does have the highest chance. And, unfair in (number eleven?) Angela's paper. Angela and Brian?
		(Stephanie and R1 inaudible)

	R1	Can you pull it down a little bit? Just pull it down a little bit.
	Stephanie	OK. For some reason-
	R1	More, more.
	Stephanie	OK, we'll just have to give player A-oh, this is Angela's idea on how to make it fair because player B has numbers that are m-have more ways to come up, so they're easier to get. Maybe, because it's a game of luck, and it doesn't matter. I-it-it helps, but it really doesn't matter cause it's a game of luck. Angela said, give player A numbers two through six. Give player B numbers eight through five. Numbers eight through twelve have the same kind of chances as two through six. If you roll seven, then you lose a turn. Because seven has the most chances. It wouldn't be fair to give player A sev-two to seven, or player B seven to twelve because the player with seven would have the most chance of winning. This is a game of luck, but I think it would be more fair. (inaudible word) And, then she drew a little picture.
		(During Stephanie above, Jeff is writing ; Michelle notices and points to a paper)
	Michelle	(during Stephanie above) Jeff. Jeff, this one doesn't make sense, but this one does.
	Jeff	Here, but this makes sense, basically, but, not any more.
	Jeff	(raises his hand) Ha. (laughs at the picture).
	Stephanie	Um.
	R1	(You?) write messages (to?) that table all the time.
	Jeff	It's scary.
	?	Bill and, w-what's his name? What's her name?
	?	I don't care. I don't care.
	Stephanie	Well, um-
	Jeff	Marie.
	Stephanie	Bill and Marie. And, that's, um, that, those are our charts, and, well, like, does anyone disagree with me?
01:10:00	Jeff	Well, I'm not disagreeing, it's just, when she was talking about the sevens, we, we marked down, we played five games, and we marked down, out of four of those games, like, sevens (inaudible) the first time, we didn't realize it, but, cause we had, when we, when you hit the seven, we figured we'd just be, like, roll again. So, the first time, the first game when we-we had no sevens in our first game, second game we had six, the third game we had (a?) four, and the fourth game we had one. So, we really, like, it doesn't mean, j-it just has a higher chance hitting it, it doesn't mean it's gonna come out.
	Stephanie	Mhmm. It's a game of luck. I know I played five games with my dad, and the first game, player B won ten nothing. The second game player B won ten three. The third game, player A won ten nine. But, it was really close, and it seemed

		that every time player A won it was really close, whereas every time player B won, they really, really beat the other player. So, it's all really luck though. And, end of story.
	R1	OK. Any other theory or discussion? Anyone else? What do you think? What do you think about this game? Matt?
	Matt?	(inaudible) I have no idea.
01:11:10	Jeff	You see, during that, during math class, Matt always loses us, but while we're here, we actually lost him.
	Stephanie	Ha-ha-ha.
	Jeff	Cause he'll ask Mr. Po a question, and will just go on this weird song and dance, and then no one knows what we're talking about, except for him, and then-
	Stephanie	And I'll know it-up to the problem Matt-
	R1	OK. Something still confuses Matt?
	Matt?	(inaudible) not something (inaudible) confused about.
	Jeff	He just doesn't want anybody to know what we're talking about.
	R1	Well, what's wrong? Is this still an issue? That, the question I-I-I raised, um, I guess, um, I asked you to think about, is, if you rolled, if you took the two dice, and you shook them well, and you rolled them both, and I asked you that question before.
	Jeff	Yeah.
	R1	Or, if you rolled one, and then another, does it matter?
	Stephanie?	No.
	Jeff	No, it's just-you see, but say it was tied up, and you needed a, like, an eleven to win, if you rolled your first die, and it came out one, there's no way you're getting a ten on this one. So, you could, you j-know you're gonna lose if you go like the, you have, you have, like, if you roll a five, then you know you have a chance. It all depends how you want to roll it. If you want to roll 'em tw-if you want to roll 'em one at a time, or if you want to roll 'em separate.
	R1	Stephanie?
01:12:14	Stephanie	Um, I was gonna say that it doesn't, like, matter in the least bit because, like, I could roll with-I could roll my die together, (inaudible word) like this, and I could say, OK, I'm gonna get a ten on this one. (rolls dice) I didn't get a ten. And I can roll it like this, and I didn't get a ten either. It doesn't matter. You're gonna get what you're gonna get, one way or another. Sure, it might make, sure, I could roll like this and get a ten, (class laughs) and I, and I could roll like this and not get a ten, but that doesn't (Stephanie laughs again)-
	Ankur	That's the second time.
	Stephanie	Oops, but it doesn't matter.
	R1	OK, (inaudible) (something to say about that?), Brian.

	Brian?	Well, see, if you're rolling with two, this could happen sometimes. But it doesn't happen, like, most of the time. Like, you could be rolling with two, and when they hit the ground, they could, like, hit each other, and they could just go flying off it, and then, but if you roll it with one and (you'll) roll it with the other, it's not going to hit each other.
	Milin?	Unless you aim it.
	Amy?	But, the(re's) possibility that they could-that it's like that, and it could hit it. It could hit it, like-
	Jeff	But there's still a possibility it could hit each other.
	Brian	Yeah, but it-it wouldn't (inaudible).
	Amy?	Like that.
	Brian?	Jeff, if you go like this-if you go like this and it hits each other, if (inaudible over class).
	Jeff	Yeah. (inaudible) if you drop it like this. Like that, but, no, if you, that could change the two.
	R1	OK. I (would?)-I have another problem I'd like you to think about really quickly.
	Class	Uh-oh.
	Jeff	Oh.
	R1	I gonna change it now.
	Jeff	Oh, don't change it. We were just getting used to this problem. (class laughs, Jeff is inaudible) – wait a second, wait.
	Romina	No.
	Jeff	Wait a sec.
	R1	Um, roll two dice, (and/if?) the sum of the two is seven, player A wins the game. If the sum is eight, player B wins. Continue rolling until there is a winner. Suppose you have a choice to be player A or player B, which would you choose, and why?
	Class	Player A.
	Student?	Cause seven has more possibilities.
	Jeff	But it doesn't mean it's gonna come out.
	Stephanie?	I know.
	Student	But it does have, like, it-
	Michelle	Doesn't eight and seven have the same amount of chances?
01:14:12	Jeff	Sarah. Papers.
	R1	Um, Matt seems to think that seven has the same number of outcomes as eight.
	Ankur?	No.

	Michelle/ot hers	It does.
	Jeff	Does it? Wait, we have it somewhere here.
	Student	Look-
	Michelle	(during Jeff above) No. (after Jeff above) It doesn't. Matt (inaudible word) had-
	Jeff	They do.
	Romina	Matt's and Ankur's-
	Michelle	No, you just switch 'em around and you have it.
	Stephanie	No, it doesn't. In this chart, pl-seven has six-six different ways. With eight, only has five. Even though there's really no difference, and it's, again, a game of luck, it doesn't matter because-it doesn't matter because, wait, OK, it do-(laughs)-i-i-it m-l'd rather be player A because player A had, maybe, one more chance than player B. And, that...
	R1	Stephanie thinks player A has one more chance than-
	Student?	Yes.
	R1	What do you mean by that? One more chance.
	Stephanie	Well, it has one more possibility.
	R1	Matt.
	Matt?	I could, I could (inaudible) chance (inaudible) impossible. The chance (inaudible) of four, and, the same two numbers. No matter which way you put it. It's not, like, it's a four and a five (inaudible)-
	Michelle	That's why she said there's only five (ways?).
	Matt?	I know. (inaudible over pen scratching near microphone)
	R1	So, you're agreeing with that?
	Matt?	Yeah.
	R1	You're agreeing with that. Um, anybody else, what do you think? So, do, you-do you want to come up here and tell me what the outcomes are for seven, and what the outcomes are for eight? (Uh, please?) write them on here. Let's see if we agree on them.
01:15:51	Romina	(responding to inaudible by Jeff) What'd you do? Look at them.
	Jeff	Yo, guys, have a little respect. (Ankur, Milin, and Brian are laughing and whispering)
		(After some silence, the tape cuts from Stephanie at the board preparing to talk to Stephanie at her seat whispering with Jeff)
	Student at board?	And it's the same here, the same here. Um, two and four, two and five, two and six, then you go to the three. Four and three, two, and four and three is-
	Jeff	Do you understand what he's trying to say (here?)?

	Student at board?	-the same as here. And then you keep on going.
	Michelle	Kind of.
	Jeff	(inaudible) lost him.
	Stephanie	See, Brian do-Brian's doesn't make sense.
	Michelle	That does make sense. It does make sense-
	Ankur	(inaudible) put one at the beginning, and-
	Michelle	-but what if there's-
	Ankur	And all the other numbers. Put two at the beginning and all the other numbers. (inaudible over Michelle and class)
	Student	Yeah, that's the hard way to do it though.
	Michelle	Easy.
	Stephanie	(inaudible).
	Ankur	You know, and you have to put the one, and then add one, two, three, four, five, six, and then it's two, and then add one, two, three, four, five, six, and then add three, one, two, three, four, five, six, and then so on-
	R2	Um, how many-how many do you get that way, Matt?
	Matt?	Thirty-six.
	R1	How do you get thirty-six? Can you tell?
	R2	I'm-I'm not convinced. You're gonna have to...
	Michelle?	Say it does make sense.
	Matt?	Alright.
	Student	(Cause/Yes?) it does.
	Student	It should stay as it does-(inaudible)
	Stephanie?	-no other towel whatsoever.
00:17:42	Jeff	What?
	Stephanie	No, she has a shirt that says flip-flop (inaudible) want a shirt that says no other towel (inaudible).
	Matt?	(during Stephanie above) Now, for every first number, so say (I have?) one, two, three, and you have four, and one, two, three, four five, six-
	Jeff	You can't do anything (inaudible).
	Matt?	Five, and, one, two, three, four, five, six, and six, and one, two, three, four, five, and six. So there's, like, there's six for every first number, so it, (see/say?) there's six main numbers-
	Michelle?	(to group?) Excuse me.

	Matt?	It's like getting, a, suffix on, or something like that. You add, like, one, and then (inaudible) one, two, three, four, five, and six on the end. And there's six base numbers. And then there's the six, six end numbers, there's the six end numbers-
	Jeff	(after writing on his paper with Stephanie and Michelle) What is that? Matt, you lost me about three hours ago.
	Stephanie	I understand though, so, Matt didn't lose me this time.
	R1	OK. H-he-help Jeff. Help Jeff.
	Jeff	I don't know what he's talking about.
	Matt?	This-this is my way-
	Jeff	A bunch of circles and a couple numbers.
		(Class breaks out momentarily unintelligible)
	Student	Six times six.
	Michelle?	Do you understand?
	Jeff	Five, six.
	Stephanie	Why don't you start with one for Jeff?
	Jeff	No.
	Stephanie	That way he knows (he's wrong?), exactly what you're doing.
	Matt?	How?
	Student	-mumbling-
	Stephanie?	You're good. (We?)'re so mean.
	Matt?	Now, there's six, and this one, right?
	Jeff	Yeah. So, that would be six and the other six, and then-
	Matt?	Six and the other six.
	Student	Yeah.
01:18:55	Jeff	OK.
	Michelle/Stephanie/Jeff/others	Six times six is thirty-six.
	Student	OK.
	Stephanie	One times one is one. Two times two is four. Three times three-
	Michelle	-three is six.
	Stephanie	-three is nine. Three times three is...
	R1	Is there another way you can show that same idea?
	Student	Well-

	Michelle	We got the same answer, except we're-we're (inaudible)
	Ankur	I have (inaudible; raises hand).
	Stephane	(during Michelle and Ankur above) (inaudible)-this weekend? Going to go to Woodstock?
	R1	Is there another way of showing that same idea, (um?), that Matt has? Thank you Matt.
	Ankur?	I do.
	Student	Did you do this?
	R1	Is there any there any other way you can show that?
	Milin?	I do. I got (to?) (write/right?) in order, but-
	R1	(R2 points to Ankur) Ankur?
	?	Shh.
	R1	Let's hear from Ankur, then we'll have Milin, and, um, Michelle's, yeah.
	Ankur?	We put one, and then put it a dash, and then plus put one, two, three-
	R1	Can you come up and show us, please, Ankur?
	Ankur?	-four-
	R1	Ankur. Ankur has another way of thinking about Matt's idea. That might help Jeff, and, do you mind, Matt?
	Stephanie	(Laughs as Ankur walks in front of the camera) I woulda moved, Ankur.
		(Jeff says something inaudible to Stephanie)
	Michelle	(inaudible) -see that marker that Jeff (inaudible)-
	Jeff	Note that Matt hasn't said anything (inaudible). Turn it (inaudible).
	R1	That's not a good one? Um-
	Student	Jeff-
	Jeff	Here.
01:19:55	R1	I can get you another one.
	Jeff	Take my blue one. I'll sacrifice.
	Stephanie	See how generous Magda is?
	Jeff	Magda?
	Ankur?	One, two, three, four-
	Stephanie	Magda, Magda.
	Jeff	Marigold.
	Ankur?	Five, six. Same with two on this. (inaudible)
	Stephanie	Gotta put my (inaudible; flips Jeff's nametag). Bill has no pupils.

		(Ankur is inaudible at board)
	R1	You want to keep on going and show us the general pattern, Ankur?
	Stephanie	(inaudible) –no, no, make lots of (inaudible).
	R1	I-I'm interested, Stephanie, in your other chart, where you did them this way-in this way.
	Stephanie	Oh, this?
	R1	No, the other one.
	Stephanie	The other one? This?
	Jeff	This one that we're gonna to explain?
	R1	(Now?), you still had another one, I'm interested-
	Stephanie	I had another one, oh. The-the dot one.
	R1	No the-the one with the numbers-
	Stephanie	This one?
	R1	-in rows and columns.
	Stephanie	This one? It's the same one as this, only this one's neater.
	R1	I'd still like you to show that-that's a little different way of looking at it.
	Stephanie	Oh, sure.
	R1	Can you put, show, (argue?) from, well (inaudible)...
	Stephanie	If you want.
		(Jeff whispers to Stephanie)
	R1	OK, what do you think about that, Jeff?
	Jeff	Well, it makes sense. It's just, like, plain English.
	R1	Want to say a little more?
	Jeff	Well, it's just, like, the way it should be. I did-ah-Mad-it was just that either me the,he put the one, and he just put, like, one through six, and it didn't look right, and then he started circling stuff, and then scared me.
01:21:15	Stephanie?	But, that's basically, almost...
	Jeff	That's just, it's just-
	Stephanie	Isn't it basically kinda what Matt did? Only, like-
	Jeff	It's just basically what Matt did, but this looks like an answer, and his looked like-
	Student	(during Jeff above) It's the same thing (inaudible).
	Student	-(inaudible) put, like, the number in front of it.
	Jeff	Yeah, (s-radish?).

	R1	OK. And you (inaudible). So, what else? What else were you going to say, Romina?
	Romina	They're the same thing.
	R1	You're saying it's another way of doing the same thing. OK. Let's-
	?	(What's that thing?).
	R1	Angela, the same thing? OK. Very good. Thank you very much, Ankur. How about you, Michelle?
	Stephanie?	Let's go, come on.
	Jeff	Am I coming?
	Stephanie	Yes (inaudible).
	Jeff	No.
	Stephanie	You have to come.
	Jeff	I'll come. What did I do though? I made dots on the paper?
	R1	Go ahead, um, Jeff.
	Jeff	But, all I did was write those little blue dots you see.
	Michelle	OK.
	Stephanie	And aren't they beautiful?
	Michelle	It's, like, Stephanie's chart, and then, see, you made the-we just counted all the little box-thingies.
	Stephanie	OK, but there's a really good-the simplest way to do it is this.
	Jeff	You coulda made that a little neater.
	Stephanie	Six numbers on one-(interrupted by bell and R1 below). OK.
	R1	Could you put that one on again, and show us (inaudible). I-I want to make sure everyone understands that chart.
	Jeff	(Class is laughing loudly) Shut up.
	Stephanie	They counted up (inaudible) boxes, everyone, they counted up the little, tiny boxes. Does everyone understand that? (Stephanie is point to a chart of possible ways of rolling dice-normal distribution around seven)
01:22:15	Michelle	All the little, tiny boxes.
	Stephanie	I-if you don't understand that, OK.
	Jeff	So, basically-
	Michelle?	Cause-
	Jeff	-what it shows is that there's, like, six numbers on the die, and, like, twelve numbers between both.
	Michelle?	Yeah, so it's like, just like, (inaudible).

	Stephanie	Alright, the really, really, really, really simple way to do it this. Six numbers on one die, six numbers on the other die.
	R1	Bring it down some.
	Michelle?	They can't see that.
	Stephanie	There's six numbers on one die, and there's six numbers on the other die, and you multiply them together and get thirty-six. (Stephanie's diagram is a modified set of boxes containing all possible combinations). Gosh.
	Jeff	Six times six-is six. We're advanced.
	R1	OK. What do the numbers on the sides represent?
	Stephanie?	Uh, on these sides?
	R1	Yeah. Let's (take/say?) in the first column, what do those numbers represent?
	Stephanie	Right here, right here, right here? (pointing to column)
	R1	Yeah.
	Jeff	They're numbers on-
	Stephanie	(inaudible with Michelle for a moment) – these (are?) numbers one of the dice, and these are the numbers on the other die.
	R1	What do the numbers in-in the body of the table mean?
	Michelle	(again inaudible talking with Stephanie at the same time at first) Uh, what the, what, like, the one and one-
	Jeff	Equal.
	Stephanie	OK, so-equals two.
	Michelle	Two.
	R1	Yeah.
	Stephanie	Is, you can get two one way. One and one.
	Jeff	(during Stephanie above)-and one. Now, you can get three two ways.
	Stephanie	You can get three two ways.
01:23:10	Jeff	Which is, like, two and...
	Stephanie	Two and one.
	Jeff	-one.
	Stephanie	That equals three. And-
	Jeff	-and-
	Stephanie	-one and two, that-
	R1	(How do you know, but?)-
	Michelle?	(inaudible) shows how many times you can get each number.
	R1	Does it tell you how m-see I'm little, um, confused here because the-the

		number in the side tell you how many times you get the number? I don't understand what the-
	Stephanie?	The number in the chart shows you the number that you get. (But?)-
	R1	How do you get it?
	Stephanie	Alright. See, the number that's placed under one of the numbers and next to the other number. So, it, like, two and one is three.
	R1	Oh, you-two and one is three. So, what are you doing to get the three?
	Stephanie?	Adding.
	R1	You're adding the two and the one.
	Jeff?	Yeah.
	R1	That makes sense, Angela? You have two on one, then one with the other. The numbers inside are the sums.
	Jeff	Yeah, (inaudible)-
	Stephanie	Yes.
	R1	The numbers on the outsides are what you roll on each of the die.
	Stephanie	Yeah.
	Michelle?	Mhmm.
	Jeff	See-
	R1	So, one would be-go ahead, Jeff.
	Jeff	Well, like, like, how it says that there's one, two, three, four, five, six, sevens, that means there's six different possible ways to get it. And-
	R1	You mean the sum of seven?
	Jeff	Yeah.
	Stephanie?	This is-this is really sloppy. The other one I made was neat, and you-
	Michelle?	Does e-Does... Does eve-does everybody remember those, like, (dinky?) little charts we used to get in second grade? That (inaudible)-
01:24:12	Jeff	Yeah-ye-and you (inaudible)-
	Michelle	One times one is one. Except, this is, like, adding one and one is two.
	Jeff	Yeah, it's like-
		(Stephanie, Michelle, and Jeff are talking at once unintelligible)
	Michelle	(inaudible) -that taught us how to add, just, kind of, you know-
	Jeff	-inside the trapper keepers, they have it-
	Stephanie?	The ones you used to cheat off of, and-
	R1	The ones that you cheat off of...
	Jeff	Yeah.

	R1	OK. So, how many outcomes are there if you're rolling two die?
	Student	Thirty-six.
	Michelle?	Thirty-six.
	R1	(inaudible-and you can count them?)?
	Jeff	And you can prove it by counting these. One, two, three, four, five, six-
	Stephanie	Six, six, six, six-
	R1	Now, my next question, um, suppose one of the dies was w-a white die, and one of the other dies was a red die. Would it matter?
	Class	No.
	Ankur?	As long as it has the same number of (inaudible/I mean?)-
	R1	What do you mean by that, Ankur? The same numbers?
	Ankur	If one dies has one through six on it, and the red die should have one through six on it.
	R1	OK.
	Student	If it has (inaudible)-
	Ankur?	And then the combinations are the same.
	R1	OK. Is there one last chart we're gonna show, Milin? One last chart. Thank you very much, that's (inaudible).
	Student	You're welcome.
	R1	Any questions for that group?
	Jeff	Mil- (Milin walks into the group returning)
	R1	I know you're getting tired, let's just listen to Milin.
	Jeff	You can keep us 'til two-twenty-two. (inaudible) that class. Oh my god, Stephanie, Bill has pupils.
	Stephanie	Oh no.
01:25:18	Student	Bill has-
		(Class breaks out in loud conversation for a moment)
	R1	(inaudible) Milin. And then we have one final question, Jeff.
	Milin	I got this from both of Stephanie's charts. Cause, it's like one of the was, like, the triangle thing, and the other one was, the other way. This shows, kind of, you could get, and I did this, basically, show both.
	R1	Could you tell us what those numbers are? Like, what's in the rows, and what those numbers are with the column? Tell us what they each represent.
		(Milin's chart is a sideways distribution, each box has been filled in with the possible ways to roll that sum)

	Milin	OK. Like, for the-for the-to get two, there's-there's only one way, and that's one and one. To get three, there's one and two, and two and one. To get four, there's two and two, one and three, and three and one. To get five, there's one and four, four and one, three and two, and two and three. For six, there's three and three, two and four, four and two, one and five, and five and one.
	R1	OK. How is that different that Stephanie's chart?
	Milin	Well-
	R1	Remember Stephanie's chart up here?
	Jeff	Is it-
	R1	How is Milin's chart different than-
	Stephanie?	Well, he did it off of this chart.
	Jeff	Yeah, he sorta did-he used those numbers on his chart.
	Stephanie	He just, like, turned, turned and then-
	Ankur?	Wrote the numbers into the square.
	Jeff	Yeah, he, like, mixed them.
	Ankur	He wrote the numbers in the blank in the squares.
	Jeff	He put them in a blank-
	R1	Oh, in the squares the numbers went in Stephanie's squares.
	Jeff	(inaudible) open (inaudible) (drilling sounds) that could happen (inaudible).
	Ankur	Instead of, like, the shaded, where the shaded, he wrote the numbers in.
	R1	OK. So-so-
	Michelle?	Basically the same.
	R1	-which way did you like it best? You had three different ways of looking at it. Did you have a-
	Student	That one.
	Jeff	I think his i-I think Milin's is-is-
01:26:48	Ankur	Shows all the numbers.
	Jeff	Because, you see-
	R1	You like to see all the numbers?
	Jeff	Matt, I was sort of confused, but Stephanie, you needed two charts to it-understand what she was saying, and Mil, Milin-
	Student	One chart does it all.
	Jeff	Milin-
	Stephanie	(Sorted it out?).
	Jeff	Milin sort of, took both, and put it in with a little bit of (milk?), and mixed it up,

		and took it out, and he got that.
	Stephanie	He summed it up.
	R1	OK. That's really great. I have one final question, are you ready?
	Jeff	(inaudible).
	Stephanie?	(Uh-oh?).
		(unintelligible class talk)
	Jeff	What is mathematics?
	R1	No, no. One final question.
	Jeff	What is mathematics?
	R1	Jeff.
	Student	Can we (inaudible) we never had play, like (inaudible) carry on, please.
	Stephanie	We don't have to go until two-twenty-two.
	R1	Hold on. We have three dice. We have to go, we have to teach another class at the university. We'd love to take you with us.
	Jeff?	Oh, (you do?).
	Student	(Class is all talking at once) Take (you?) with us.
	R1	We have three dice here.
	Jeff?	(What/Where?) do you teach? Like, what class do you teach?
	R1	OK.
	Student	Math.
	Student	They teach science.
	Jeff	Maybe my brother has them.
	R2	(inaudible to R1) –but the-
	R1	Right now, here's my question. I have three dice.
	Jeff	Mhmm.
01:27:38	Stephanie?	OK. Can you tell me-can you tell me-
	Student	-how it goes-
	R1	-and again I'm interested in, ah, I'm rolling three-
	Student	Yeah.
	R1	-and I'm interested in that-the possible sums you can get. Can you get in- imagine in your head the possible-How many possible outcomes are there if you're rolling three?
	Ankur	Six times six times six.
	Student	Two-hundred-and-sixty-two.

	Jeff	Well the obvious thing is b-how we usually do it-
	Ankur?	Six times six-
	Jeff	(unintelligible/slurred)-that would be six times six times six.
	Ankur	Times six.
	Jeff	But actually, it would turn out to be something different cause we're just jumping to a conclusion.
	Ankur?	No.
	Stephanie?	And you're-
	Michelle	How would you know, Ankur?
	R1	(during Michelle above) (inaudible) quite (inaudible) six times six-(after Michelle above) OK. So, why don't you think when we come back. We want to hear that.
	Michelle?	(during R1 above?) How can you be positive (inaudible)?
	R1	And if-if that's true, I want you to come up with some way of showing that.
	R2	Can I ask one more question?
	R1	Yeah.
	Student	Twenty-one.
	R2	Not only do I want to know how-
	Student	-two-hundred-sixteen- (sounds like Ankur, Jeff and Stephanie are whispering)
	R2	-if-if I were to, if-if I were to ask you to choose which one number, you would want to pick-
	R1	For a sum.
	R2	(You'd like to pick?), what was the one number from this one? For a sum that you wanted to pick? If you had one chance to roll the dice, and everything was on it, what number would you choose?
	Student	Seven.
01:28:37	R1	What (Student's name, inaudible)? (responding to student off camera)
	Class	Seven.
	R2	Yeah, does everybody agree on that? (Kay?). Suppose you're rolling three, what is the one number-
	Student	Nothing.
	R2	-that you would choose?
	R1	That's your thing to talk about. Do you want us to come back?
	Stephanie	Ah-h. Yeah, come back.
		(Class all responds at once)

	Student	How about tomorrow?
	Jeff	OK, look.
	R1	OK. We can't come back tomorrow. We're going to be going to (inaudible). We're going to come back again (inaudible word). Did you like this topic? Is this a good thing to do?
	Students	Yeah.
	R1	Game theory. Are you interested in game theory? (class discusses unintelligibly) And you want to come to Rutgers some time?
	Students	Yeah.
	R1	We have all these things we have to arrange.
	R2	(We'll?) work on it.
	R1	I want to thank all of you. I want to make sure your names are on the paper. Name on your paper.
	R2	Oh, hey, uh- (talks to Ankur)
	R1	And I want to thank you. This has been great fun.
	Jeff	Brian. Million dollar roll.
	R1	You were just great.
	Brian?	Seven.
	Stephanie	(hits Jeff in the back of the head) He said, you lost, number seven.
		(Class lines up and exits very loudly)
	R1	Talk about the next one, and write up why you it.
	Student	OK.
		(Students continue exiting)
01:30:00	Student	I could stay there the whole time.
	R1	What do you guys think? (inaudible) and Alison.
	R?	I'm so sorry.
	R?	They're incredible.