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| 時間 | 学 習 内 容 | 生徒の学習活動 | 留意点 |
| 5分  13分  10分  5分  8分  2分  5分  2分 | グループで自己紹介  さいころのルールの説明＆さいころ作成  チーム内で対戦  チームで１つのさいころを選ぶ  チーム対抗トーナメント  (準決勝まで)  優勝チームの予想  決勝戦  まとめ | 自己紹介の内容  ①名前・国・学校名  ②趣味(クラブ)  ③自分の国のおすすめの食べ物紹介  正四面体でのさいころの紹介  目のパターンは   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | 目  ① | 目  ② | 目  ③ | 目  ④ | 和 | 期待値 | | A | 1 | 2 | 3 | 4 | 10 | 2.5 | | B | 1 | 1 | 4 | 4 | 10 | 2.5 | | C | 2 | 2 | 3 | 3 | 10 | 2.5 | | D | 2 | 2 | 2 | 4 | 10 | 2.5 | | E | 1 | 3 | 3 | 3 | 10 | 2.5 |   これの期待値は等しいことを確認  ≪ルール≫  ・さいころを１つ選ぶ  ・後ろ向きに投げる？※要実験  ・3つ先勝で勝利  A4用紙で正四面体さいころ作り  チーム内で対戦させる  これは練習なので、楽しくわいわい  班で1つのさいころを選ぶ。その際に勝ち方が平等かどうかを考える。  1戦目と2戦目でさいころを変えるのは○  相手のさいころを見てから自分のさいころを変えるのは×  負けたチームは勝てるさいころを考える  各班で決勝戦の予想をたてる  全員で決勝戦の行方を見守る  勝敗の有利不利を見つけ出した班があればその考え方を発表させる。  なければヒントを出し、オープンエンドで終わらせる。 | 話せない生徒への手助け  期待値は未履修なので、  さらっと  A4用紙7～8枚ほど配布  折り紙が苦手な生徒への手助け(特に海外生)  対戦表を書くなどして確かめている班がないかを目星をつけておく。  不正がないように、もめないように巡視  理論通りの強いさいころが残っているとは限らない。 |

**Math World Dice Challenge (Japanese Lesson Plan)**

**Math World Dice Challenge (English Script)**

Hello everyone. Welcome to “Math World”!! I’m ○○, a ○○ teacher at ○○ school. Today’s challenge is a dice game. I hope you enjoy this class.

First, I’d like to start by asking you all to introduce yourselves to your groups.  
Please include the following your introductions:

1. Your name, school and the country you are from.
2. What is your hobby? What do you like to do in your free time?
3. What is your favorite food in your country?  
   Please explain the taste, how it looks, and how it is made.

Today you will work your groups. So please get to know each other well. You have 5 minutes! (1 minute for each person)

Time is up! Did you get to know your group members better? As I told you, today you will play a dice game in your group. When I say “dice”, what kind of shape do you imagine? Most of you might imagine a cubic die which has 6 sides. However, there are many other types of dice like 10-sided dice, 8-sided dice, and 4-sided dice. Today we will use this one. It’s a 4-sided dice also known as tetrahedron dice. Usually the dice has a different number on each side. To make the game more fun, I want you to use unusual dice.

These are 4 types of dice. Dice A is a normal one. Dice B has 1, 1, 4, 4 on each side. We use only numbers 1 to 4. The sum of the numbers should be 10. The expected values are the same. It looks like a fair game, doesn’t it?

Before we start the game, let’s make tetrahedron dice together! You have some sheets of A4 paper on your desk. Take one sheet of paper.

1. Fold the paper in half the long way, or lengthwise. Please make sure your folds are sharp.
2. Fold again along the long way and unfold once.
3. Fold corner A to the center line. Crease at B
4. Fold BC to line CD
5. Fold BE to line EF
6. Fold EC to line BD
7. Fold CF to line BC
8. Unfold to Step 3
9. Insert this area into this pocket

I’m going to explain the game rules. First, each player chooses one dice from type A to D. Do not take the same one. Then throw your dice at the same time. The bigger number is stronger. Play several times and the winner is the one who gets 3 out of 5. Do you understand?

Group A, who is the champion in your group? Which dice did you use? How about Group B? ・・・・

What do you think about these results? Was it a fair game? Which one is the strongest dice? Please talk in your group and choose the strongest dice for the final competition.

Did you choose your dice? Let’s play the game with groups A&B, C&D, E&F, G&H. Please tell me the winners after the game.

The next game is Group ○&○, ○&○, ○&○, ○&○.

The next round is the final one. The finalists are groups ○ and ○. Which dice are you using?

Which group has a better possibility to win? Raise your hand group ○ or ○. Let’s make sure.

Even if the expected values are the same, it looks like there are stronger dice. These are tables of the pattern of this game. In this game, the B dice has a better possibility to win. Of course, you may be able to win anytime. But if you know mathematics and can think logically, your life will be more enjoyable. Thank you for joining this class.

②　Fold again and unfold

⑧　Unfold to Step ③

⑦　Fold CF to line BC

E

B

F

C

⑥　Fold EC to line BD

E

D

B

F

C

⑤　Fold BE to line EF

E

C

D

B

F

④　Fold BC to line CD

B

C

D

A

③　Fold corner A to the center line.

Crease at B

A

B

①　Fold

②　Fold again and unfold

⑧　Unfold to Step ③

⑦　Fold CF to line BC

E

B

F

C

⑥　Fold EC to line BD

E

D

B

F

C

⑤　Fold BE to line EF

E

C

D

B

F

④　Fold BC to line CD

B

C

D

A

③　Fold corner A to the center line.

Crease at B

A

B

①　Fold

**How to Fold a Tetrahedron with A4 Paper**

Pocket

⑨ Insert the red area into the pocket