SCIENTIFIC METHOD 1º ESO PROJECT:

ANALIZING THE METHODS OF SANITATION ON MASKS

Name:……………………………………………………………Group:……….

**Objectives:**

1.-To work scientifically

2,.To develop the imagination and the habilities of problem solving in our students

**Methodology:**

After having studied the scientific method in our biology class, the students have to apply it to a real situation. The problem is related to the sanitation of masks, We would like to study the best way to sanitize the masks against bacteria.

**Steps:**

**1.- Research** on the types of masks and the ways to sanitize them. Write down a summary of the research and choose two sanitation methods for our experiment.

**2.-Problem**: How to make the mask cleaner? (from bacteria, obviously, not viruses)

**3.-Hypothesis**: The resuable mask will get cleaner from bacteria using method 1 ………..than method 2………..

**4.- Dependent and independent variable:**

Dependent: (What we measure) :

Independent variable. (What we change) :

**5.- Experiment:**

1.- Materials:

- A used disposable mask

- 7 metallic lids previously boiled to make them sterile (or cristal bowls or yougourt caps sterilezed with alcohol)

- sanitizer (if needed)

- water and agar-agar or jelly

-half a spoon of sugar and a cube (caldo)

- kitchen plastic film

- twizers, scissors, a pot, a bowl or glass

2.- Method:

Cuto ut 7 pieces of the central part of the mask. Do not touch them too much. Keep one in a plastic bag. Take 3 pieces and sanitize them with the method number 1 and 3 more and sanitize them with method 2.

Now, prepare the jelly or the agar mixing the pulver with 250 ml of hot water. The wáter has to boil prevoiously with the cube and sugar. Add the hot water to the agar but passing the water through a colander. Use 1 bag of agar for a glass of wáter.

The agar seems to work better than the jelly, it stays solid for more time.

Pour some mixture in the clean metallic lids, or cristal glasses or plastic cups; cover them with the plastic film and set aside. It s a good idea to mark a paper with numbers 1 to 7 and to sit a lid (or the cup) close to each number. By doing this we will be sure that we are counting the bacteria in the right lid (or plastic or glass cup)

When the jelly or agar is solid, open the plastic film a bit and, using the twizzers, introduce the piece of mask touching the jelly (or agar) with it. Make this quicky to prevent other bacteria getting in and falling on the jelly. Close with the plastic film and let the lid in its place for 3 days. Repeat this using a different piece of mask for each lid with jelly.

Touch the agar of the first lid or cup with the piece of mask that was NOT sanitized. Then, the 2nd, 3rd, and 4th with the 3 pieces that were sanitized with method 1, and the 5th, 6th and 7th with the pieces sanitized with method 2.

**6.- Analyzing data:**

Three days later you can open the lids and count the number of colonies and the color of them. Write the numbers in the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Lid | Mask | Nº of White colonies ( 3 days later) | Nº of coloured colonies ( 3 days later ) | Total number of colonies |
| Nº1 | Control |  |  |  |
| Nº2 | Fragment1 method1 |  |  |  |
| Nº3 | Fragment 2 method1 |  |  |  |
| Nº4 | Fragment 3 method1 |  |  |  |
| Nº5 | Fragment 1 method2 |  |  |  |
| Nº6 | Fragment2 method2 |  |  |  |
| Nº7 | Fragment 3 method2 |  |  |  |

Let´s calculate now the **average** of colonies:

Method 1 Average = colonies of lids 2+3+4 / total colonies

Method 2 Average= colonies of lids 5+6+7 / total colonies

**7.-Results**

The mask produce an average number of colonies ……………………..with sanitation 1:…………………and an average number …………………………..with sanitation 2:……………………….

**8.- Conclusion**

The conclusión has to match the hypothesis, proving it right or wrong.

I learned that the disposable mask gets cleaner / equally clean using method 1 than using method 2.

**9.- Bibliography**

Make a list of materials usesd to research the topic: web pages, books, magazines, newspapers, videos. Remember to mention authors, editors and year.

**10.- Difficulties**

What difficulties did you find when doing the Project? What would you change?

**SCIENTIFIC REPORT RUBRIC**  TEACHER RUBRIC. 1ESO.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Items | 3 points | 2 points | 1 /0 points | Total |
| 1 | Report Steps | Steps followed and presented in time, corrected | Some steps missing, the teacher had to chase the student to revise the work | Not presented, work alone without the teacher knowing |  |
| 2 | Report | Beautiful, organized, clear, neat. Pictures and graphs included.  The pictures are related to the text and are not only nice. Easy to read, important things are highlighted | Not very organized, more beautiful than clear.  Information is not connected. Pictures not very related to the text. | Disorganized, not clear. Difficult to read and to understand. Not relevant information or pictures.  Many mistakes. |  |
| 3 | Experiment | All the steps. The Science behind the experiment is correct. | Results and conclusions mixed up. The science is not totally correct. | No structure, messy.  Science is not correct. |  |
| 4 | ENGLISH | Report: not more than 4 mistakes. ¨IT HAVE¨ hasn’t been said. | Report: not correct. ¨IT HAVE¨ is said. | Mistakes on the report. ¨IT HAVE¨ many times. |  |
| Total |  |  |  |  | /12 |

TIMING:

Research and hypothesis: Novemnber the 3rd

Experiment, variables, results: november the 16th

Conclusion, bibliography, and difficulties: November the 26th