**Science (S1-3)**

**Updated Curriculum (2017)**

**Unit 4: Cells, Human Reproduction and Heredity**

**Topic: DNA and Heredity**

**The Code of DNA**

**(Student’s Version)**

Ms TSANG Mei Yuet

Ms SIU Chi Ying

Precious Blood Secondary School

**Science Education Section, Curriculum Development Institute,**

**Education Bureau**

**Science (S1-3)**

**Unit 4: Cells, Human Reproduction and Heredity**

**Topic: DNA and Heredity**

**The Code of DNA**

**【Learning Objectives】**

After this learning activity, students should be able to:

1. Understand that the instructions encoded in DNA depend on the sequence of bases on the DNA; and
2. Recognise that DNA encodes the instructions that determine our different traits.

**Activity A:** Decode the Morse code

|  |
| --- |
| Morse code is a character encoding scheme used in telecommunication. This kind of code is composed of intermittent sound or flash. By reading the code from the Morse Code Character Table, the meaning of the message encrypted in Morse code can be found.  |

Simplified Morse Code Character Table

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A | ‧－ | H | ‧‧‧‧ | O | － － － | U | ‧‧－ |
| B | －‧‧‧ | I | ‧‧ | P | ‧－ －‧ | V | ‧‧‧－ |
| C | －‧－‧ | J | ‧－ － － | Q | － －‧－ | W | ‧─ ─ |
| D | －‧‧ | K | －‧－ | R | ‧－‧ | X | －‧‧－ |
| E | ‧ | L | ‧－‧‧ | S | ‧‧‧ | Y | －‧－ － |
| F | ‧‧－‧ | M | － － | T | － | Z | － －‧‧ |
| G | ─ ─‧ | N | －‧ |  |  |  |  |

1. The teacher will send you a message in terms of sound or flash. Decode the message according to the Morse Code Character Table above. Write down the alphabet in the space provided.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |

1. The characteristics of the Morse code：

|  |
| --- |
|  |
|  |
|  |

1. According to the teacher’s briefing, I learn that the characteristics of DNA code are:

|  |
| --- |
|  * Every\_\_\_\_\_\_\_bases make up one unit.
* All bases will only be read \_\_\_\_\_\_\_\_\_.
 |

1. Decode the following DNA base sequence by making reference to the Table for decoding the DNA code provided by the teacher.

DNA base sequence：

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **A** | **A** | **C** | **T** | **G** | **G** | **G** | **A** | **T** | **T** | **C** | **A** | **T** | **T** | **C** | **G** | **C** | **T** | **T** | **C** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | **T** | **T** | **C** | **G** | **C** | **G** | **A** | **A** | **T** | **G** | **T** | **C** | **G** | **C** | **G** | **A** | **A** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **T** | **A** | **T** | **T** | **A** | **C** | **A** | **T** | **A** | **C** | **C** | **A** | **T** | **A** | **C** | **G** | **T** |

The decoded message of the DNA base sequence is ：

|  |
| --- |
|  |

**Activity B : Cracking the DNA code**

1. Each group will be provided with:
* a face outline diagram which may be a boy or a girl, and
* a sheet with some facial characteristics of one of the family members written in

‘DNA code’.

1. By making reference to the Table for decoding the DNA code provided by the teacher, decode the DNA code into some facial characteristics of the family member. Draw the characteristics on the face outline diagram.