清宮科技展

# 西洋奇器

## Western Scientific Instruments of the Qing Court
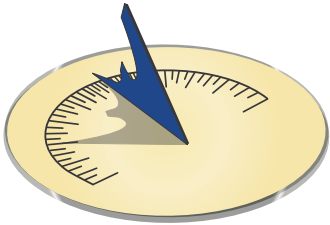
### 26.6 – 23.9.2015
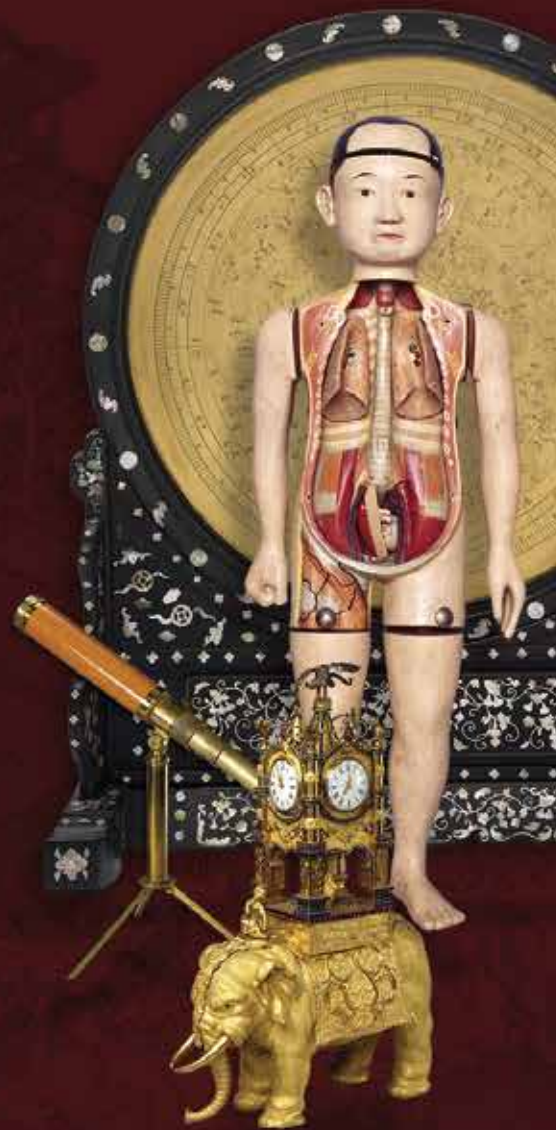
# Activity Sheet

## FOR P.4 - S.3 Students

# ASTRONOMY

## (I) Sundial and Timepiece

Both the Sundial and the Mechanical Watch are timing devices. Can you tell if they can meet the conditions in the following table? (Put a ✓ to indicate your answer)

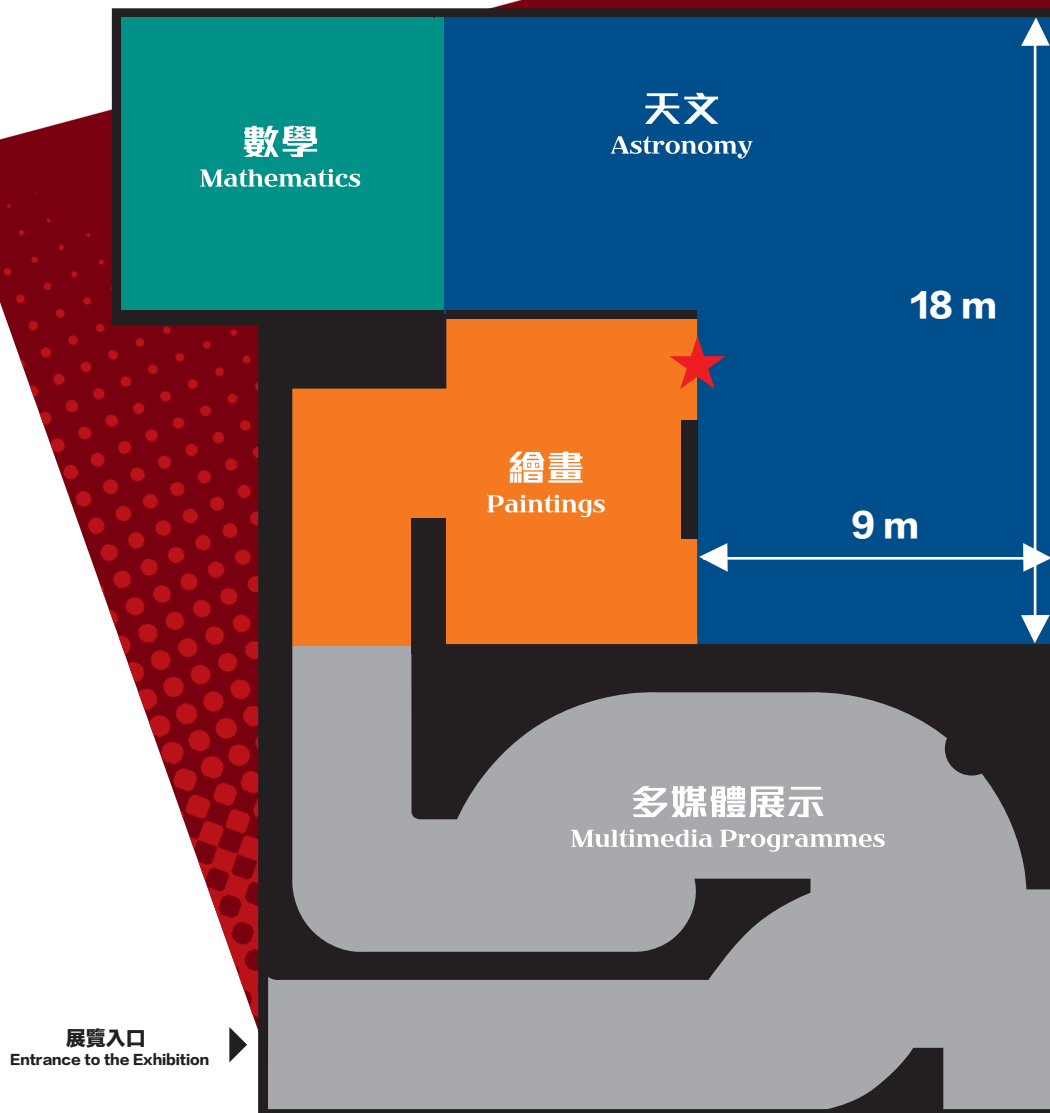| | Sundial | Mechanical Watch |
|---|---|---|
| | Tells the time by the shadow of the Sun on the dial plate | Hour and minute arms driven by gears |
| Environmentally Friendly | | |
| Sustainable | | |
| No Regional Restriction | | |
| Convenient | | |
| Accurate | | |

# ASTRONOMY

## (II) Finding the "Visionary" Exhibit in the Museum

Start at the location marked with a ⭐ in the floorplan below. Follow the instructions and look for the most "visionary" exhibit in the gallery.

Instructions:
1) Head north for 3 m
2) Head west for 9 m
3) Head north for 2 m

➤N

數學
**Mathematics**

天文
**Astronomy**

18 m

9 m

繪畫
**Paintings**

多媒體展示
**Multimedia Programmes**

展覽入口
**Entrance to the Exhibition** ▶

**The most "visionary" exhibit is:** _____

# MATHEMATICS

People always wanted to speed up the process of calculation and improve the accuracy by developing new tools. In fact, the human brain is a very precise calculator. As long as we keep practising, our brain will refine its precision.

## (I) The Four Arithmetic Operations

In the following exercises, fill in the boxes with appropriate arithmetic operators of "+ − × ÷" and apply brackets where necessary to make the result equal to the answer. (Please record the time used to complete the exercises)

1 )  1 ☐ 2 ☐ 3  =  1

2 )  1 ☐ 2 ☐ 3 ☐ 4  =  1

3 )  1 ☐ 2 ☐ 3 ☐ 4 ☐ 5  =  1

4 )  1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6  =  1

5 )  1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7  =  1

6 )  1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8  =  1

7 )  1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9  =  1

**Your time recorded is:** _____

## (II) Magic Square

Fill in a number from 1 to 9 to each square of the 3 by 3 grid below (no repetition of number is allowed) to make every row, column and diagonal adds up to the same number. (Please record the time used to complete this exercise)

**Your time recorded is:** _____

# MEASUREMENT

## Investigating with a Balance

The Empress has 9 equal-weight gold coins. A thief sneaked into the Forbidden City and stole one of them. He replaced it by a fake one hoping that it would go unnoticed but unfortunately the fake coin is lighter in weight. Can you sort out the fake gold coin among the real ones by only weighing them twice in the balance? Then you can get the fingerprints from the fake gold coin to bring the thief to justice.

**First weighing**
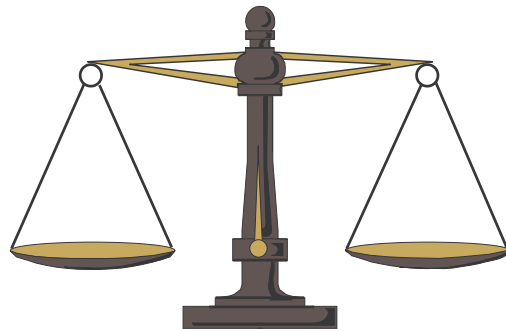(Please draw the coins on the balance) :
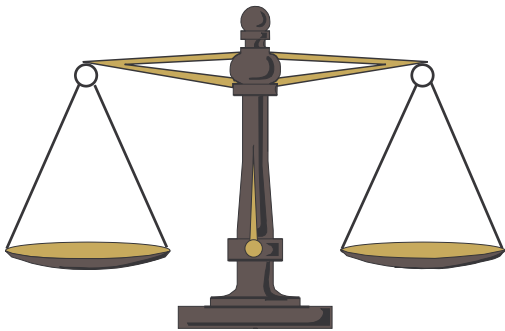
**Answer:**

_____

_____

_____

_____

_____

_____

_____

_____

_____

**Second weighing**
(Please draw the coins on the balance) :

**Answer:**

_____

_____

_____

_____

_____

_____

_____

_____

_____

# MEDICINE

**Keen Observation**

Look into the microscope. What can you see? Please draw them in the boxes below.

Name : _____

Name : _____

Name : _____

Name : _____
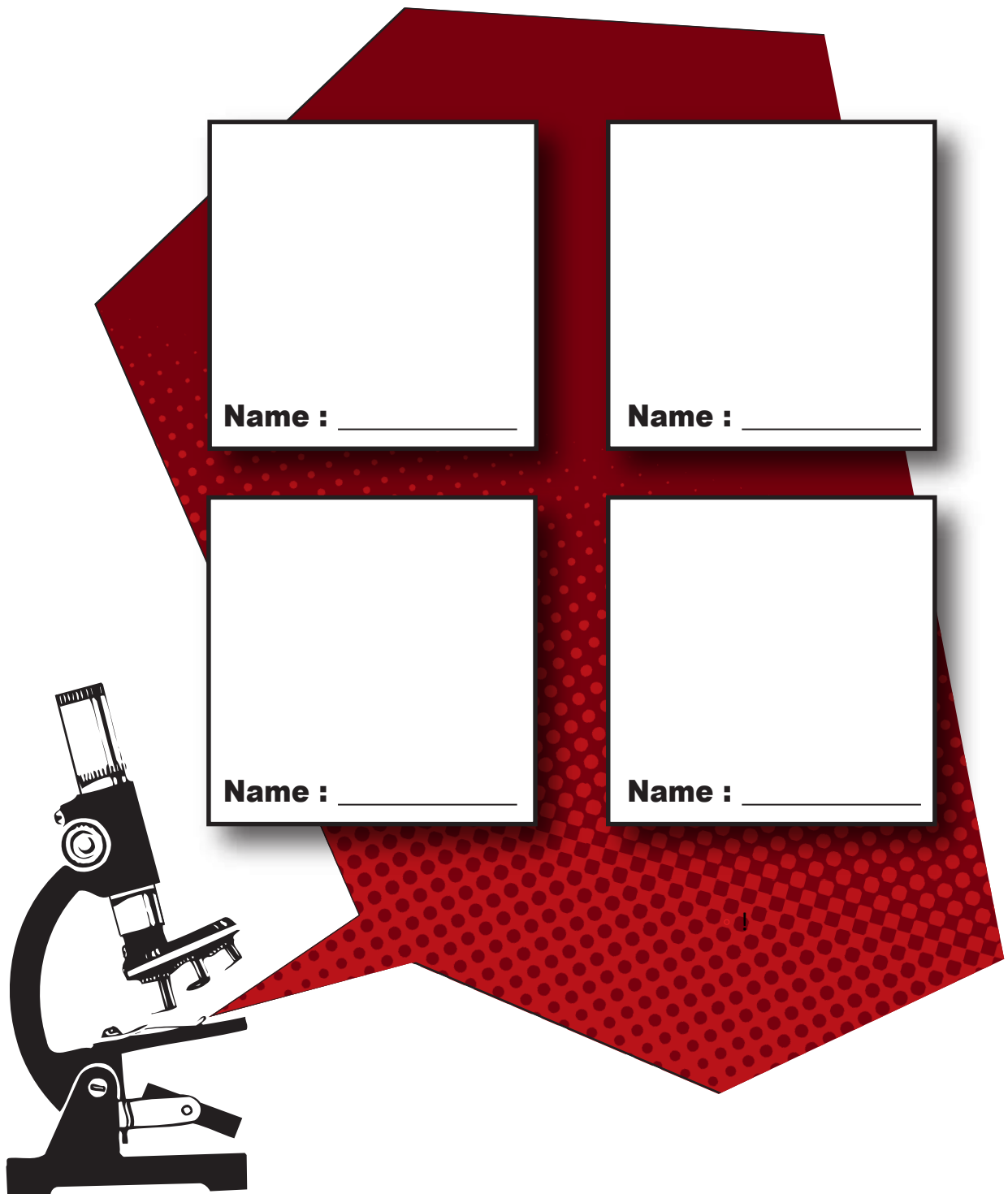
## Great Deal of Contributions

Gunpowder and Cannon were born in China and they later went abroad to the western countries. Now they meet again in the Hong Kong Science Museum and boast of their contributions to humankind. The following is the first part of their conversation. Please complete the conversation for them.

I am a cannon, a kind of heavy weapon. I have done a lot of things for human beings,

_____

_____

_____

_____

_____

I am a gunpowder, one of the Four Great Inventions in China. I can be used for different purposes,

_____

_____

_____

_____

# CLOCK

## (I) When Hour Hand Meets Minute Hand

The Empress likes the delicate design of the revolving floral clock very much. She looks at the floral clock very often and discovers that the hour hand overlaps the minute hand at 12 o'clock at noon. She really wants to know how many times they would overlap each other within 12 hours during the day. Can you tell her the answer?
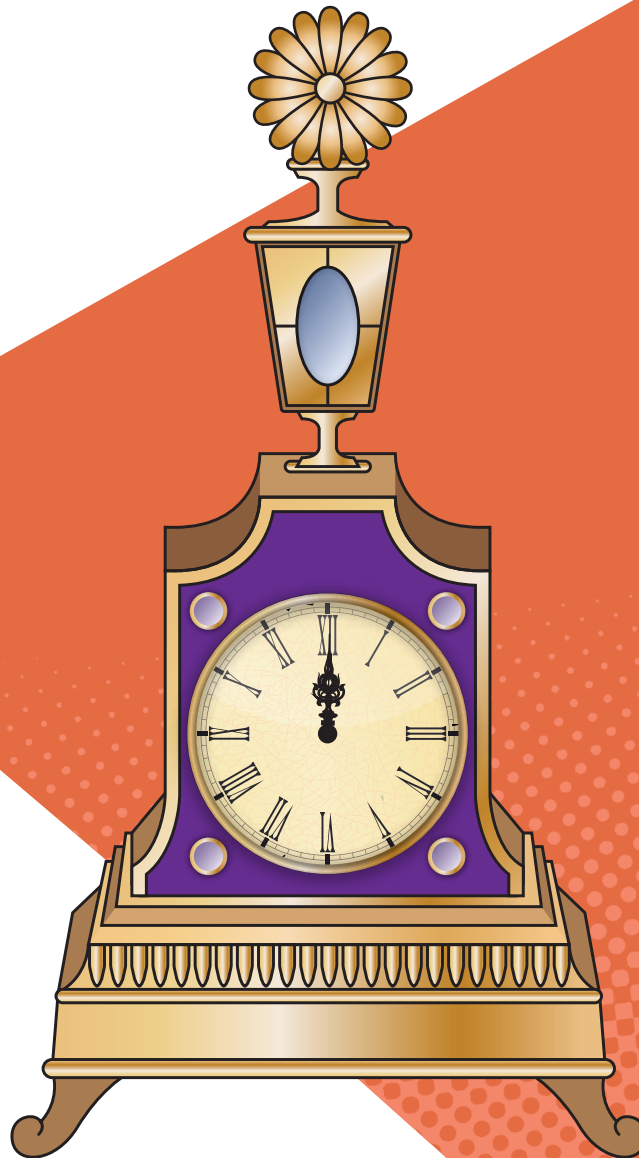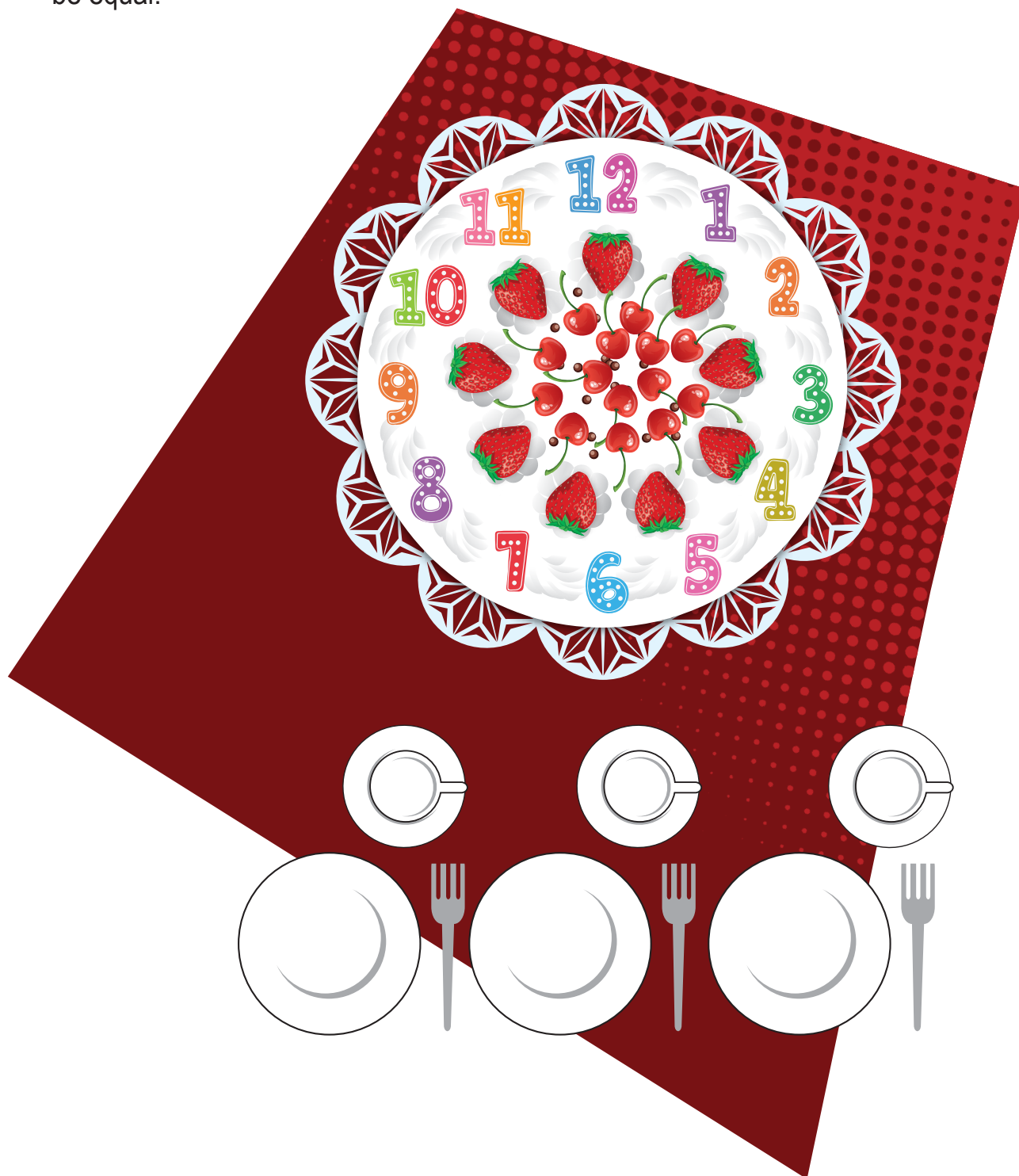
**Within 12 hours, the hour hand and the minute hand of the clock would overlap _____ times.**

# CLOCK

## (II) Cutting the Cake

Puyi, Pujie and their sister are having afternoon tea together. The Imperial Kitchen has prepared a clock-shaped cake for them. Please serve them the cake by cutting it into 3 pieces, under the constraint that the sum of the numbers on each piece must be equal.

# CLOCK

## (III) Football Kicking Machine

After having the afternoon tea, Puyi wants to play the Football Kicking Machine. Should he turn the hand crank in the clockwise or anticlockwise direction to score a goal?
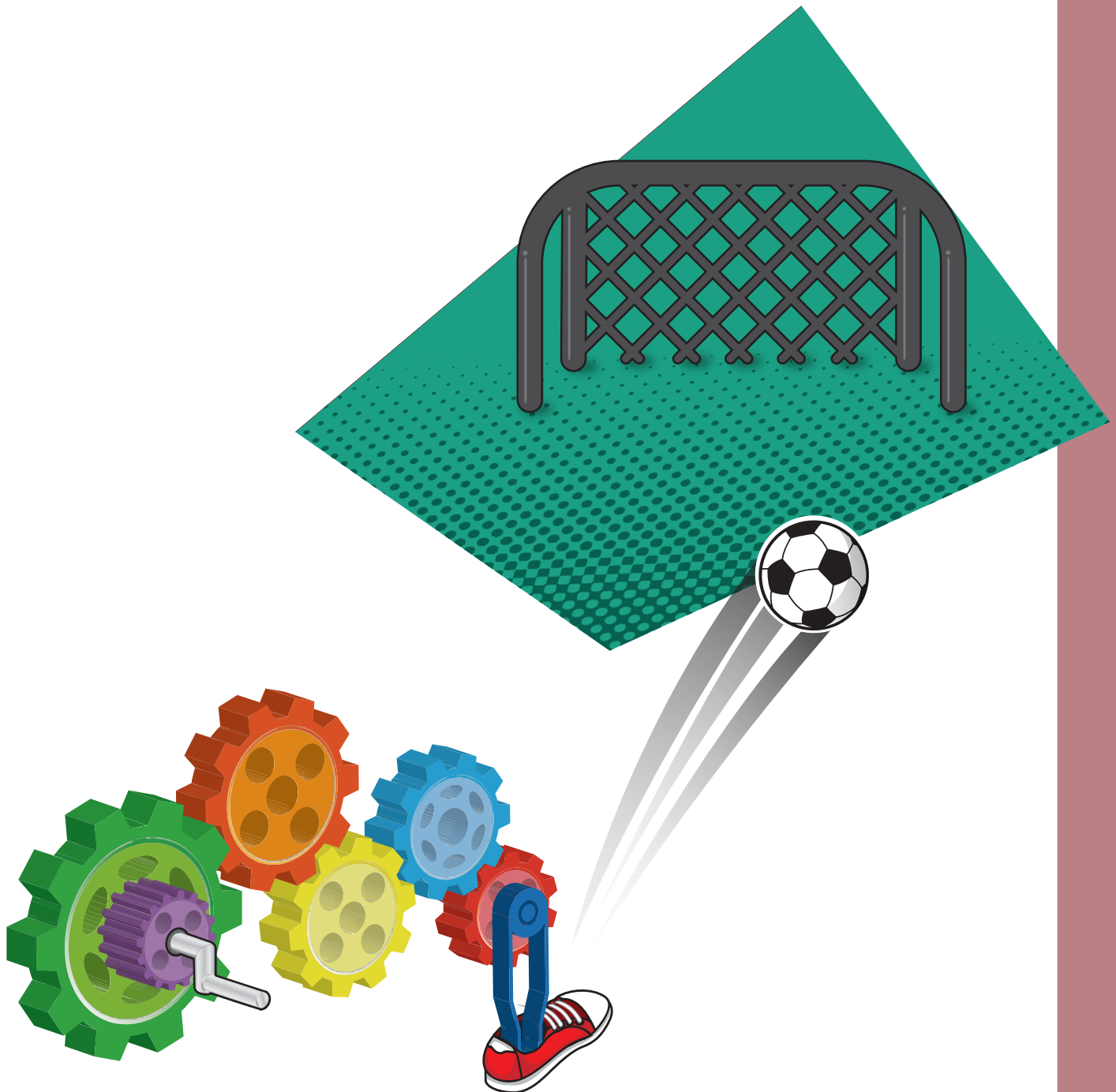
**Answer:** _____

# ARTICLES FOR DAILY USE

## You've Got a Voice Message from the Past

Gramophone is the first machine that can "speak". It stores sound by using the groove in records. Thereafter, sweet sounds of singing and great speech can be stored and be played at different time and space.

Please use your mobile phone to scan the QR-Code on the right. Listen to Puyi's voice message and complete the profile for him.

Note: The voice message is in Cantonese only.

## Profile

**Surname :** _____

**Given Name :** _____

**Identity :** _____

**Place of Enthronement :** _____

**Age at Enthronement :** _____