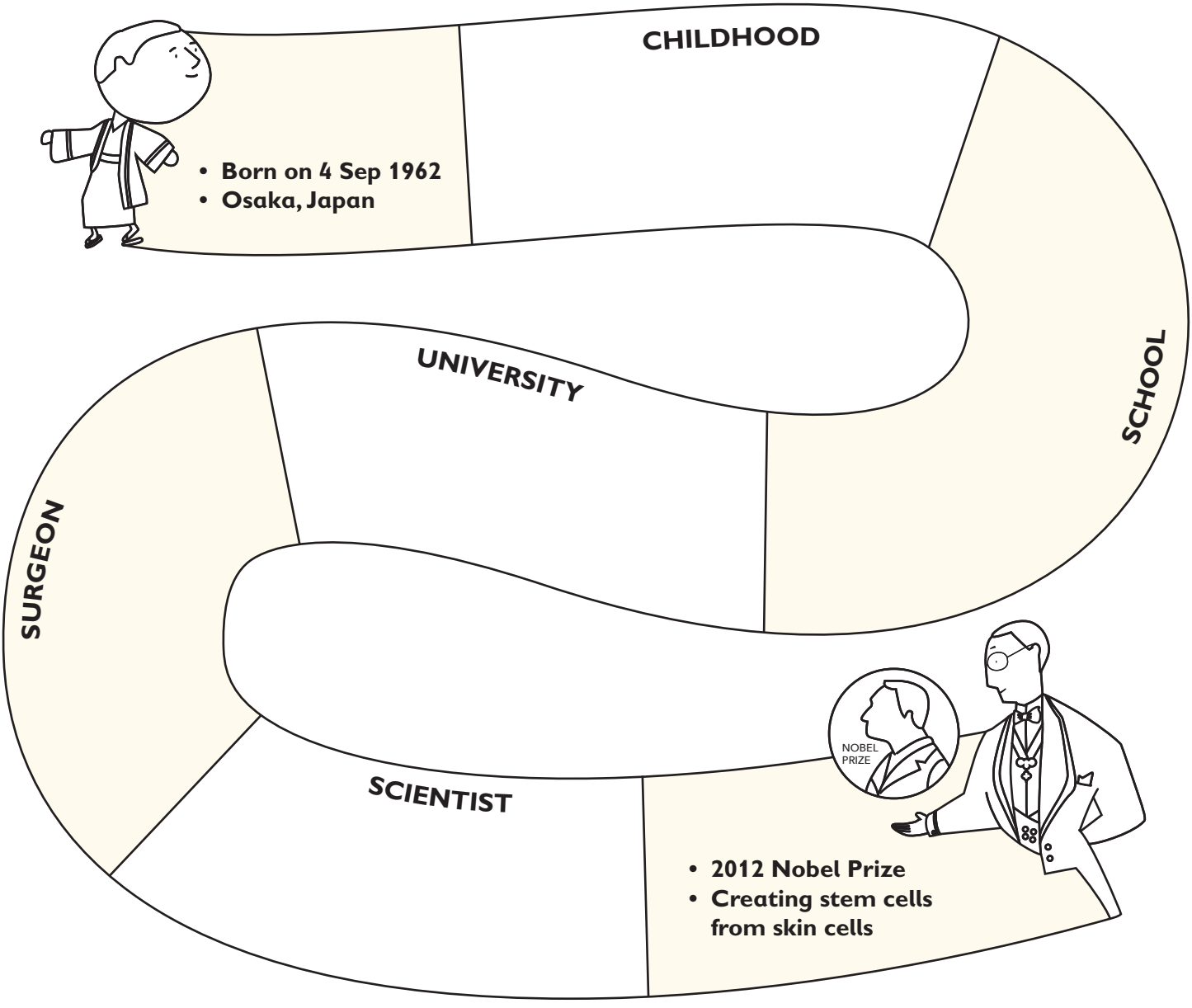
SHINYA YAMANAKA

ACTIVITY SHEET

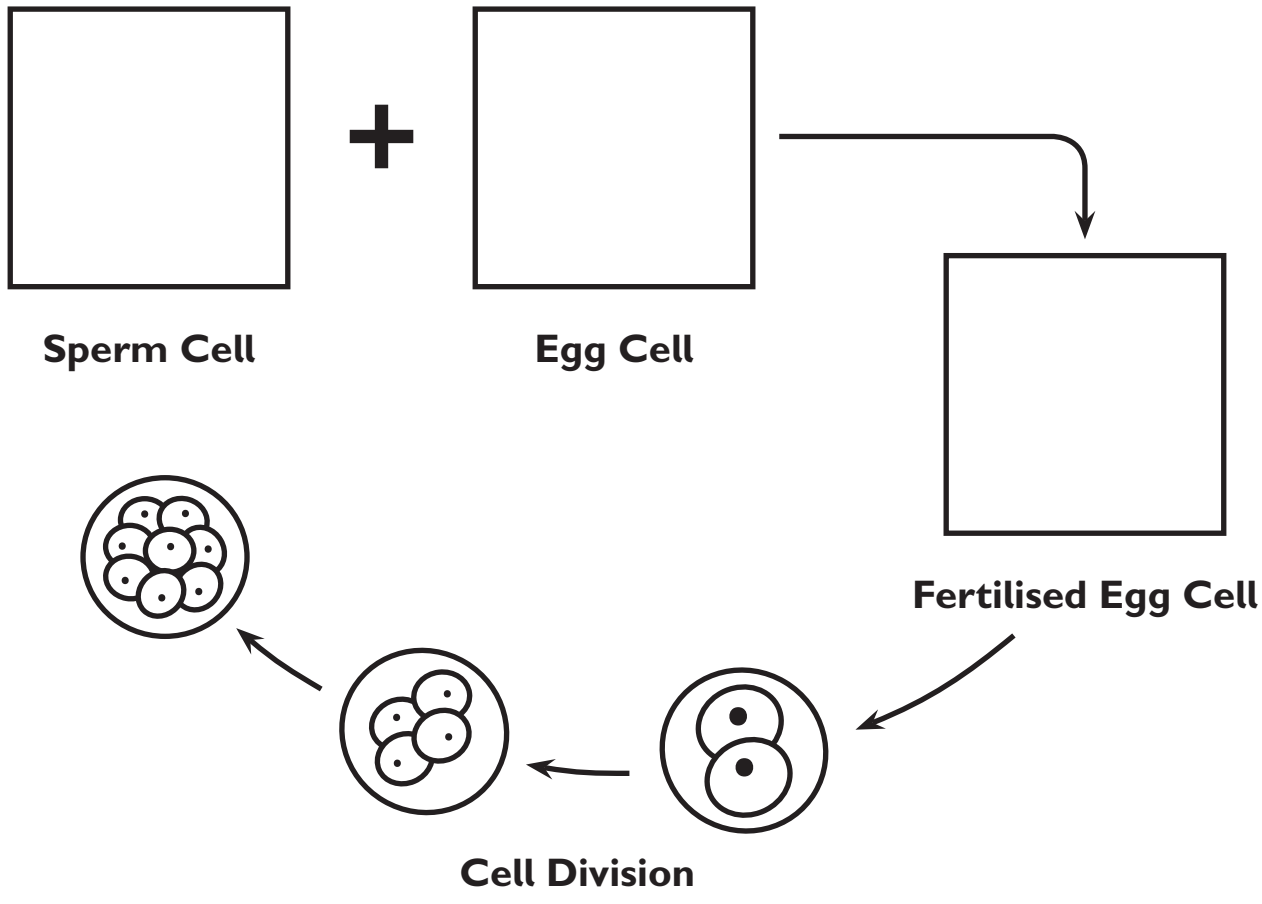
What happened at each stage of Shinya Yamanaka's life that led him to his Nobel Prize in 2012?



ACTIVITY SHEET

Describe three values which Shinya Yamanaka has as a scientist that led him to his success.

Shinya Yamanaka studied stem cells. Draw how an embryo is formed, based on what you have read in the first two pages of the book.



UDUPI RAO

ACTIVITY SHEET

Udupi Rao is fondly remembered as the father of the Indian Satellite Program. Based on what you have read, circle whether you agree with the statements below and explain why.

1. Udupi Rao displayed perseverance and resilience as a scientist.

Agree / Disagree

Explain why:

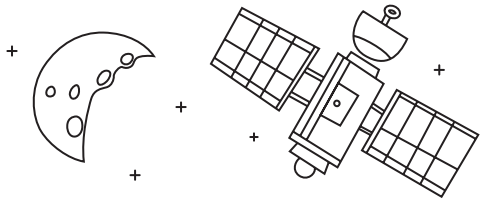
2. Udupi Rao's success was all due to his own efforts.

Agree / Disagree

Explain why:

ACTIVITY SHEET

Complete the mindmap below, based on your reading and research.



Artficial Satellites

- **What is an artificial satellite?**
- **What are artificial satellites used for?**
- **What is the history of artificial satellites?**
  - **Singapore**
  - **World**
  - **India**

CHANG MEEMANN

ACTIVITY SHEET

Let's learn more about this amazing Asian scientist!

Facts about Chang Meemann

Her Early Life

When and where was she born?

What was she interested in?

What did she decide to be?

Her Discoveries

Where did she go for her university education?

What did she discover back in her homeland?

Her Achievements

What institute was Meemann asked to lead?

What animals were named after her?

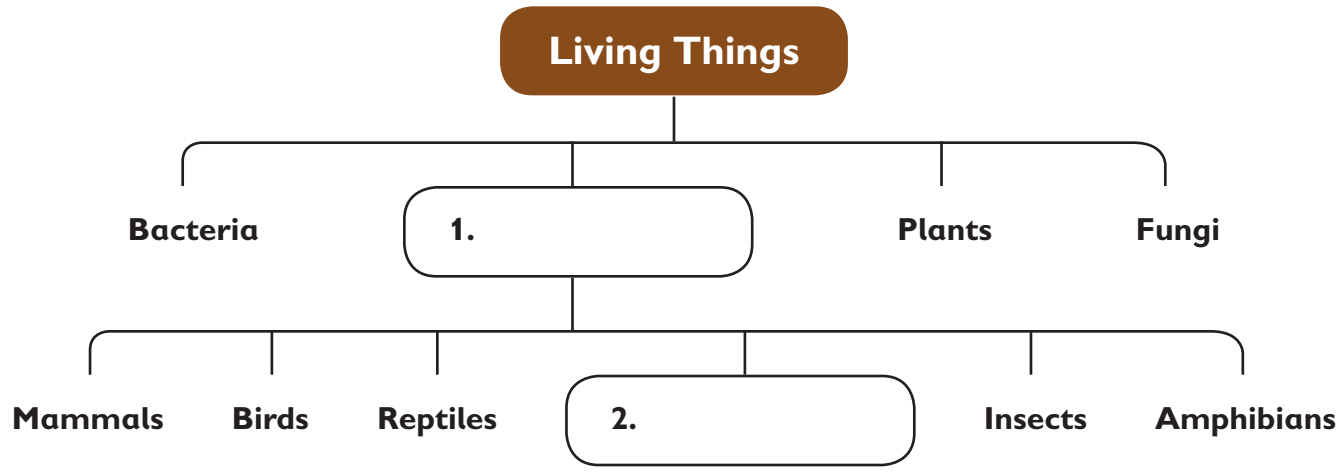
ACTIVITY SHEET

Circle one value that you admire the most in Chang Meemann as a scientist.

Humble	Passionate	Determined	Adventurous

How has Chang Meemann shown this value?

Chang Meemann is particularly interested in one group of living things. Complete the chart below.



List the characteristics of the living thing found in (2).

TU YOUYOU

ACTIVITY SHEET

A) Let's have an interview with this amazing Asian scientist!

If you were Tou Youyou, what would your responses to these interview questions be?

Question 1: **In the past, very few girls went to school. Why were you able to attend school?**

Tu Youyou: _____

_____

_____

_____

Question 2: **Why did you decide to become a medical researcher?**

Tu Youyou: _____

_____

_____

_____

ACTIVITY SHEET

Question 3: **Why was there a need to find a new medicine for malaria?**

Tu Youyou: _____

_____

_____

_____

Question 4: **How did you eventually discover Artemisia herb as a cure for malaria?**

Tu Youyou: _____

_____

_____

_____

Question 5: **What were the challenges you faced and the sacrifices you had to make to find a cure for malaria?**

Tu Youyou: _____

_____

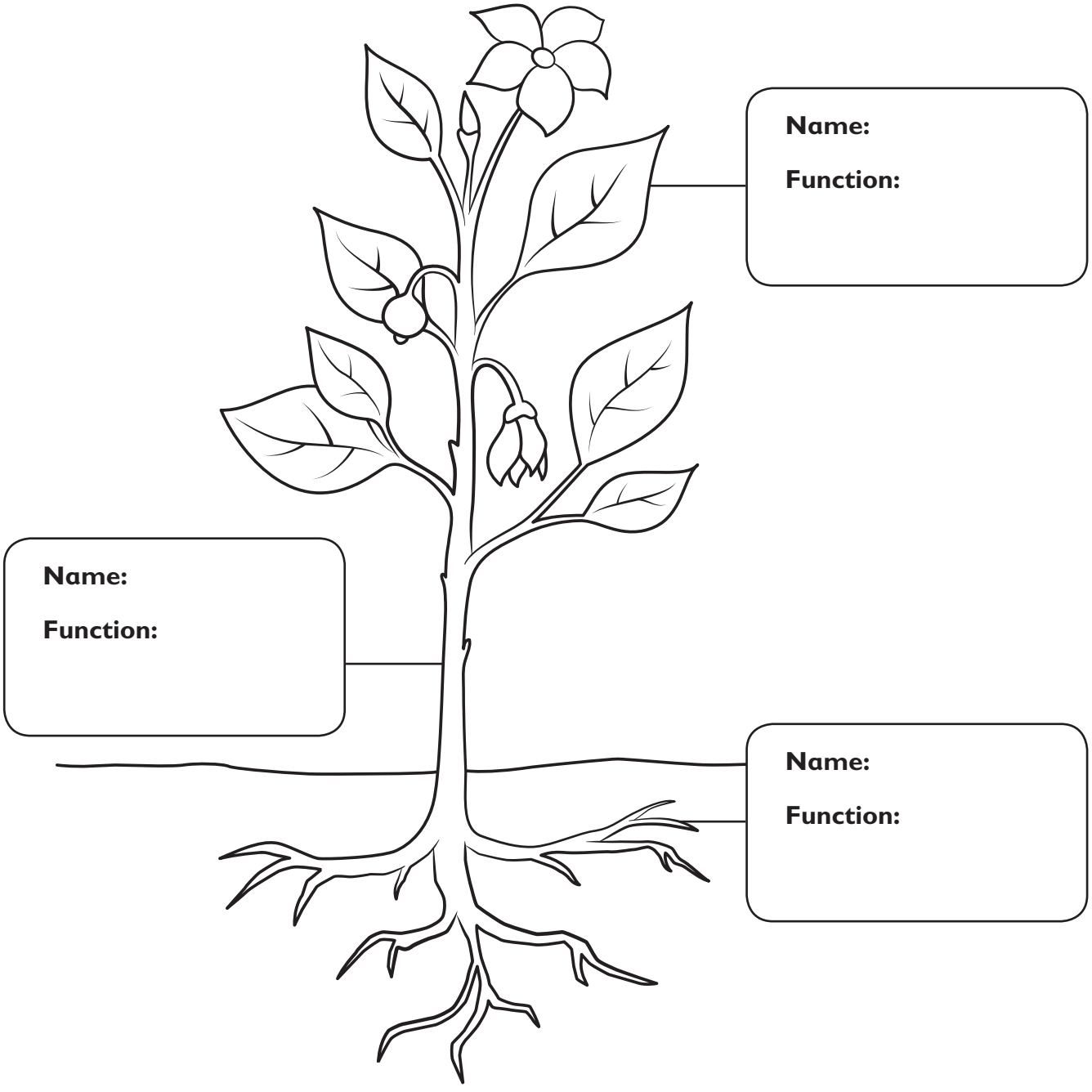
_____

_____

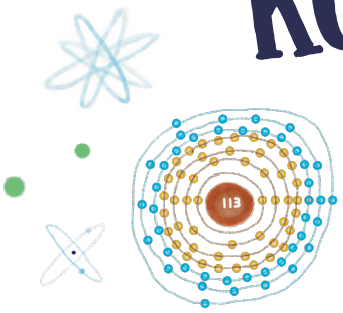
ACTIVITY SHEET

B) Tu Youyou discovered that the leaves of the Artemisia herb could be turned into a medicine. In fact, each part of the plant (leaf, stem and roots) serves a different function for the plant itself.

Label each plant part below and state its function.



KŌSUKE MORITA



ACTIVITY SHEET

A) Let's have an interview with this amazing Asian scientist!

Based on Kōsuke Morita's responses, craft out your interview questions for him.

Interviewer: **What** _____

_____

Kōsuke Morita: As a child, I enjoyed tinkering and even built myself a radio from scratch. In high school, I loved physics and was fascinated by how things move, how rainbows are made and how one can be weightless in space!

Interviewer: **Why** _____

_____

Kōsuke Morita: I was frustrated and disappointed as I found it hard to understand many of the ideas which my professors were trying to teach me.

ACTIVITY SHEET

Interviewer: **How** _____

_____

Kōsuke Morita: **At Riken, my research institute in Japan, I became fascinated by the elements of the periodic table. With passion and hard work, I managed to finish my studies eventually.**

Interviewer: **Why** _____

_____

Kōsuke Morita: **Well, even though my team and I were ecstatic about our success in making and discovering element 113 within a year, we knew that was not enough. As responsible scientists, we needed to ensure that our results were correct and hence we persisted for the next nine years to check our results over and over again.**

Interviewer: **Why** _____

_____

Kōsuke Morita: **I named element 113 "nihonium", as "nihon" is the Japanese word for Japan. To be the first Asian country to discover an element, my team and I are indeed very proud.**

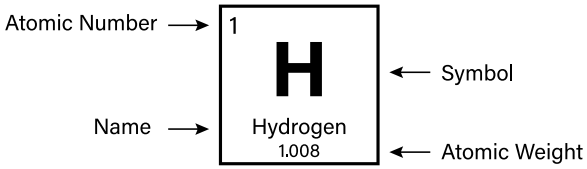
ACTIVITY SHEET

B) Kōsuke Morita and his team made and discovered nihonium, which is a man-made element. An element is a substance that cannot be separated into simpler substances.

Refer to the periodic table on the next page to find out what elements these symbols below represent.

Symbols	Elements
H	
C	
O	
Cu	
Hg	
Fe	
I	
N	
Al	
Nh	

Periodic Table of the Elements



1 IA	2 IIA	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8 VIIIB	9 VIIIB	10 VIIIB	11 IB	12 IIB	13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1 H Hydrogen 1,008																	2 He Helium 4,002602
3 Li Lithium 6,94	4 Be Beryllium 9,0121831											5 B Boron 10,81	6 C Carbon 12,011	7 N Nitrogen 14,007	8 O Oxygen 15,999	9 F Fluorine 18,998403163	10 Ne Neon 20,1797
11 Na Sodium 22,98976928	12 Mg Magnesium 24,305											13 Al Aluminium 26,9815385	14 Si Silicon 28,085	15 P Phosphorus 30,973761998	16 S Sulfur 32,06	17 Cl Chlorine 35,45	18 Ar Argon 39,948
19 K Potassium 39,0983	20 Ca Calcium 40,078	21 Sc Scandium 44,955908	22 Ti Titanium 47,867	23 V Vanadium 50,9415	24 Cr Chromium 51,9961	25 Mn Manganese 54,938044	26 Fe Iron 55,845	27 Co Cobalt 58,933194	28 Ni Nickel 58,6934	29 Cu Copper 63,546	30 Zn Zinc 65,38	31 Ga Gallium 69,723	32 Ge Germanium 72,630	33 As Arsenic 74,921595	34 Se Selenium 78,971	35 Br Bromine 79,904	36 Kr Krypton 83,798
37 Rb Rubidium 85,4678	38 Sr Strontium 87,62	39 Y Yttrium 88,90584	40 Zr Zirconium 91,224	41 Nb Niobium 92,90637	42 Mo Molybdenum 95,95	43 Tc Technetium (98)	44 Ru Ruthenium 101,07	45 Rh Rhodium 102,90550	46 Pd Palladium 106,42	47 Ag Silver 107,8682	48 Cd Cadmium 112,414	49 In Indium 114,818	50 Sn Tin 118,710	51 Sb Antimony 121,760	52 Te Tellurium 127,60	53 I Iodine 126,90447	54 Xe Xenon 131,293
55 Cs Caesium 132,90545196	56 Ba Barium 137,327	57 - 71 Lanthanoids	72 Hf Hafnium 178,49	73 Ta Tantalum 180,94788	74 W Tungsten 183,84	75 Re Rhenium 186,207	76 Os Osmium 190,23	77 Ir Iridium 192,217	78 Pt Platinum 195,084	79 Au Gold 196,966569	80 Hg Mercury 200,592	81 Tl Thallium 204,38	82 Pb Lead 207,2	83 Bi Bismuth 208,98040	84 Po Polonium (209)	85 At Astatine (210)	86 Rn Radon (222)
87 Fr Francium (223)	88 Ra Radium (226)	89 - 103 Actinoids	104 Rf Rutherfordium (267)	105 Db Dubnium (268)	106 Sg Seaborgium (269)	107 Bh Bohrium (270)	108 Hs Hassium (269)	109 Mt Meitnerium (278)	110 Ds Darmstadtium (281)	111 Rg Roentgenium (282)	112 Cn Copernicium (285)	113 Nh Nihonium (286)	114 Fl Flerovium (289)	115 Mc Moscovium (289)	116 Lv Livermorium (293)	117 Ts Tennessine (294)	118 Og Oganesson (294)

57 La Lanthanum 138,90547	58 Ce Cerium 140,116	59 Pr Praseodymium 140,90766	60 Nd Neodymium 144,242	61 Pm Promethium (145)	62 Sm Samarium 150,36	63 Eu Europium 151,964	64 Gd Gadolinium 157,25	65 Tb Terbium 158,92535	66 Dy Dysprosium 162,500	67 Ho Holmium 164,93033	68 Er Erbium 167,259	69 Tm Thulium 168,93422	70 Yb Ytterbium 173,045	71 Lu Lutetium 174,9668
89 Ac Actinium (227)	90 Th Thorium 232,0377	91 Pa Protactinium 231,03588	92 U Uranium 238,02891	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (266)

CHOU LOKE MING

ACTIVITY SHEET

Jot down interesting background information about Chou Loke Ming, such as his education, interests and discoveries.

Research and explain why coral reefs in Singapore and all around the world are dying.

ACTIVITY SHEET

Research and explain why the Sisters' Island Marine Park was established.

Chou Loke Ming turned his passion for the environment into a lifelong career. As an individual, is there one environmental problem that you would like to address? What can you do about it?