

# MODULE THREE : ACHIEVEMENTS

## UNIT FOUR : SUCCESS STORIES

KEY WORD	MEANING IN ENGLISH	MEANING IN ARABIC
arithmetic (n)	the branch of mathematics concerned with numerical calculations such as addition, subtraction, multiplication and division	علم الحساب
geometry (n)	the branch of mathematics concerned with the properties, relationships and measurement of points, lines, curves and surfaces geometric (adjective) - geometrically (adverb)	هندسة
mathematician(n)	a person who studies Mathematics to a very complex level mathematics (noun) - mathematical (adjective)	مختص في الرياضيات
philosopher(n)	someone who studies and writes philosophy professionally, or an undergraduate student of Philosophy philosophise (verb) - philosophical (adjective)	فيلسوف
physician(n)	someone qualified to practise medicine, especially one who specialises in diagnosis and treatment	طبيب
polymath(n)	someone who has a lot of knowledge about many different subjects	متعدد جوانب الثقافة
algebra(n)	a type of mathematics system where letters and symbols are used to represent numbers algebraic (adjective)	علم الجبر
camera obscura(n)	Latin for 'dark room'; an optical device that led to photography and the invention of the camera	الحجرة السوداء
composition(n)	(of music) a piece of music that someone has written compose (verb)	مقطوعة موسيقية
demonstration(n)	an act of explaining and showing how to do something, or how something works demonstrate (verb)	توضيح / شرح
desalination(n)	the process of removing salt from sea water so that it can be used desalinate (verb)	تحلية ماء البحر
fountain pen(n)	a pen which needs ink cartridge refills and the nib of which takes ink from these cartridges to write	قلم حبر (يعاد تعبأته)
grid (n)	(energy grid) a system of wires through which electricity is connected to different power stations across a region	شبكة كهربائية
ground-breaking(adj)	new, innovative break (verb)	جديد/ابداعي
inheritance (n)	money or things that you get from someone after they die inherit (verb)	ميراث
inoculation (n)	an injection you can have to protect you from a disease inoculate (verb) - inoculable (adjective)	تطعيم
irrigate(v)	to supply land with water so that crops and plants will grow irrigation (noun)	يسقي
minaret(n)	the tall, thin tower of a mosque from which Muslims are called to prayer	منذنة/ منارة
outweigh(v)	to be more important than something else	يفوقه في الاهمية

pedestrian(n)	someone who is walking, especially along a street or another place that is used by cars pedestrian (adjective)	الممشاة
qualify(v)	to be entitled to a particular benefit or privilege by fulfilling a necessary condition qualification (noun)	يؤهل
revolutionise (v)	to completely change the way people do something or think about something revolution (n) - revolutionary (adj)	يحدث ثورة في
sustainability (n)	the state of being able to continue forever, or for a very long time; for example, the sustainability of the environment involves emitting less pollution and using less water sustain (verb) - sustainable (adjective)	ديمومة/ استمرارية
textiles (plural noun)	types of cloth or woven fabric	نسيج/ قماش
translation (n)	the process of converting documents from one language to another translate (verb) - translator (noun)	ترجمة
windmill (n)	a building that uses its sails and wind power to grind corn into flour	طاحونة هواء
talent(n)	special ability	موهبة
founder(n)	the person who starts something new	مؤسس
scales (n)	an instrument to measure weight	ميزان
laboratory(n)	a room for scientific experiments	مختبر
legacy(n)	what someone leaves to the world after their death	ارث حضاري
fertile(n)	agriculturally productive	ارض خصبة
cheques (n)		شيك مصرفي
crystal glasses (n)		نظارات زجاجية
chemist(n)		كيميائي
neutral(adj)		محايد
renewable(adj)		متجددة
waste(n+adj)		مخلفات
major(n+adj)		رئيسي

Ex 2 p28

Answers

- 1 subjects: arithmetic, geometry
- 2 people specialised in certain fields of study: mathematician, philosopher, physician, polymath

Ex 3 p28

Answers

- a Jabir ibn Hayyan b Al-Kindi c Ali ibn Nafi'

Research Box.

Answer

Ibn al-Haitham invented it. A camera obscura (which means 'dark room' in Latin) is an optical device that projects an image of its surroundings onto a screen. Its invention led to the invention of the camera.

SB p28

1. Who is considered as the founder of chemistry?  
.....
2. Jabir ibn Hayyan is most well known for two achievements. Write down these two achievements.  
.....
3. The scales that Jabir ibn Hayyan invented revolutionized the way chemists weighed items in a laboratory. What characterized this set of scales?  
.....
4. Why was Ali ibn Nafi' also known as Ziryab?  
.....
5. What was special about Ziryab?  
.....
6. Ziryab had many achievements in the field of music. Write down two of these achievements.  
.....
7. What was the most important achievement that Fatima al-Fihri did in her life?  
.....
8. What proves that Al-Kindi was a true polymath?  
.....
9. As far as historians believe, what made Al-Kindi most famous?  
.....
10. What do the underlined words refer to?  
.....
11. What does the underlined word "ground-breaking" mean?  
.....
12. Find a word in the text which means the same as "money or things that you get from someone after they die."  
.....
13. Do you think that it was easier or more difficult in those days to reach such high levels of achievement in comparison with the present day? Give a reason for your opinion.  
.....  
.....

## Answers

1. Jabir ibn Hayyan
2. a. He is most well known for the beginning of the production of sulphuric acid.  
b. He also built a set of scales which changed the way in which chemists weighed items in a laboratory.
3. His scales could weigh items over 6,000 times smaller than a kilogram.
4. Because of his beautiful voice.
5. He was a gifted pupil of a famous musician from Baghdad, and it was his talent for music that led him to Cordoba in the ninth century CE.
6. He is the person who established the first music school in the world in Cordoba, Al-Andalus, teaching musical harmony and composition. He revolutionised musical theory, and is also the person who introduced the oud to Europe.
7. She used her father's inheritance to build a learning centre in Fez, Morocco.
8. Al-Kindi was a physician, philosopher, mathematician, chemist, musician and astronomer
9. It is probably his work in arithmetic and geometry that has made him most famous.
10. الاجابات موجودة على الدوسية نفسها
11. new, innovative
12. inheritance
13. Suggested answer

I think that it was more difficult for people in the past to reach such high levels of achievement in comparison with the present day: there was much less access to information in the past, so people like Al-Kindi had to be truly revolutionary and creative in their thinking in order to succeed.

## Ex 4 p 29

### Suggested answers

- Jabir ibn Hayyan is known as the founder of chemistry. He began the production of sulphuric acid and invented scales that could weigh very light things.
- Ali ibn Nafi' established the first music school in the world in Cordoba, Al-Andalus, and introduced the oud to Europe.
- Fatima al-Fihri built a learning centre in Morocco, which became a world famous university.
- Al-Kindi was a polymath, most famous for his work in arithmetic and geometry.

## Ex 5 p 29

### Suggested answer

I think that it was more difficult for people in the past to reach such high levels of achievement in comparison with the present day: there was much less access to information in the past, so people like Al-Kindi had to be truly revolutionary and creative in their thinking in order to succeed.

## Ex 6 p 29

1 - b

2 - c

3 - a

## Ex 7 P 29

### Answers

- The person who invented the mechanical clock in the twelfth century was Al-Jazari.  
**OR** It was Al-Jazari who/that invented the mechanical clock in the twelfth century.
- The thing that Al-Jazari invented in the twelfth century was the mechanical clock.  
**OR** It was the mechanical clock that Al-Jazari invented in the twelfth century.
- The period/time when Al-Jazari invented the mechanical clock was the twelfth century.  
**OR** It was in the twelfth century that Al-Jazari invented the mechanical clock.

## Ex 8 P 29

### Answers

- 1 The person who contributed to the invention of the oud was Al-Kindi.
- 2 The country where Jabir ibn Hayyan did his research in a laboratory was Iraq.
- 3 It was Ali ibn Nafi' who established the first music school in the world.
- 4 It was Jabir ibn Hayyan who/that also invented ink that can be read in the dark.
- 5 It is for his work in geometry that Al-Kindi is especially famous.

## Ex 9 P. 29

### Suggested answers

- 1 My father was the person who influenced me most because he was so kind.
- 2 The person in the article that I think was the most successful was Al-Kindi because he was an expert in many fields.
- 3 The way in which I would define success is being very good at something you care about.

# Listening P30

## Audioscript

Coffee, chess, flying, the clock, windmills, algebra, soap, the fountain pen, crystal glasses, inoculation, cheques, carpets ... What all these items have in common is their origins. They all have their roots in Arab or Islamic discoveries or inventions made in the past. It was the time when Arab and Islamic rulers established one of the largest empires in history.

During this period, artists, engineers, scholars, poets, philosophers, geographers and traders in the Islamic world made ground-breaking advancements in many different areas, from agriculture and industry to philosophy, science and technology, literature, music and the arts.

It was another area of Arab and Islamic expertise, that of navigation and trade, that introduced their discoveries, inventions and developments to other parts of the world. In Al-Andalus, for example, trade and agriculture improved under Arab rule. There were huge advancements in arts and science, and Cordoba, the capital of Andalusia at that time, became the largest and greatest city in Europe.

By the tenth century, Cordoba had a population of about 500,000. There were 700 mosques, about 60,000 palaces and 70 libraries, the largest of which had 600,000 books! Cordoba also had around 900 public baths, and it was there where Europe's first street lights appeared. Just outside the city stood the magnificent Madinat az-Zahra', the royal palace. It took 40 years to build and, until it was destroyed in the eleventh century, it was one of the wonders of the age. It is now in the process of being restored to its former glory.

Ex 2 P 30

## Answer

They all have their roots in Arab or Islamic discoveries and inventions made in the past.

Ex 3 P 30

## Answers

- 1 Under Arab rule, trade and agriculture improved in Andalusia. There were also huge advancements in arts and science.
- 2 The capital of Andalusia was Cordoba.
- 3 Cordoba had a population of about 500,000.
- 4 The building of the royal palace took 40 years.

Ex 4 P 30

## Answers

### 1 Defining relative clauses:

- who is believed to be responsible for the design of the tower

### Non-defining relative clauses:

- which is one of the most important buildings in Seville, Spain
- which was originally a minaret
- who began work in 1184 CE
- which is in Marrakesh, Morocco

2 people – who, that; animals and things – which, that; places – where, which, that

Quotation P 31

ازدهرت الحضارة الإسلامية المشرقة في المنطقة الممتدة من الهند إلى إسبانيا.

Tell them that Bertrand Russell (/ˈbɜːtrænd ˌrʌsəl/), as well as being a philosopher, was also a logician, mathematician, historian and social critic. The quotation shows that Islam was leading the way in the world, showing how great a civilisation it was at that time.

(7)

(8)

Ex 1 p 32

**Suggested answers**

- 1 Megaprojects are huge investment projects that cost a lot of money. Examples include developments such as airports, bridges, stations, entire city complexes, etc.
- 2 They exist to bring new economic growth and benefits to cities.
- 3 Disadvantages are that they are all brand new and some people think it would be better to spend the money on regenerating old towns, etc. However, the advantages include installing the latest technology that helps cities to become environmentally friendly.

Ex 3 p 33

**Answers**

- 1 Examples of projects include motorways, airports, stations, tunnels, bridges and entire city complexes.
- 2 The advantages include the fact that it will be the world's first carbon-neutral, zero-waste city. It will also be a car-free zone, although there will be excellent public transport. The disadvantage is that existing cities are nowhere near as environmentally clean, and many people think the money should have been spent on cleaning up existing places and making them more sustainable.
- 3 Students' own answers

Ex 5 p 33

**Answers**

- 1 economic growth
- 2 negative effects
- 3 carbon footprint
- 4 public transport
- 5 biological waste
- 6 urban planning

Ex 6 p 33

**Suggested answer**

I think that a megaproject like Masdar City would be very successful in Jordan: it would encourage investment in the country and benefit the population by providing an environmentally-friendly space for people to live in. However, we would have to be careful not to overshadow the natural beauty of our country with too much building: we would have to find the perfect balance between modernity and nature.

1. According to the text, megaprojects are designed to achieve two goals. Write down these two goals.

2. There are many forms of megaprojects. Write down two of these forms.

3. What do all megaprojects have in common?

4. Megaprojects differ in terms of two important characteristics. Write down these two characteristics.

5. Why have many megaprojects been criticised?

6. Masdar City is very special because it will have several characteristics in the near future. Write down two of these characteristics.

7. The writer says that certain types of people are expected to live in Masdar City when it is completed in 2025. Write down two of these types.

8. Masdar City is intended to be carbon-neutral. How will it achieve this?

9. Two means of transport will connect Masdar City to other locations. Write down these two means of transport.

10. The writer says that there will be some sources of power that will supply Masdar City with energy. Write down two of these sources of power.

11. How will Masdar City be provided with fresh water when it is completed in the future?

12. According to the text, two items in Masdar city will be recycled. Mention these two items.

13. Who are the current residents of Masdar City?

14. What is the main goal of Masdar City Institute of Science and Technology?

15. Who supports Masdar City megaproject?

16. What is the main point of criticism that Masdar City faces?

17. What do the underlined words refer to?

18. What examples of megaprojects are provided in the essay?

19. What are the advantages of the creation of Masdar City? What are the disadvantages?

20. Do you think that Masdar City is a beneficial project or not? Give your reasons.

21. Do you think that a similar project to Masdar City would be successful in Jordan? What advantages and disadvantages can you think of? Discuss in pairs.

### Answers

1. Megaprojects are designed to encourage economic growth and bring new benefits to cities.

2. Megaprojects vary in terms of size and cost.

3. They are all, by definition, expensive, public projects that attract a high level of interest and media coverage.

4. Examples of projects include motorways, airports, stations, tunnels, bridges and entire city complexes.

5. Many megaprojects have been criticised because of their negative effects on a community or the environment.

6. Masdar City will be the world's first carbon-neutral, zero-waste artificially-created city.

7. It is expected to house more than 40,000 residents, 50,000 commuters.

8. Masdar City will be a car-free zone, designed to be pedestrian and cycle-friendly. Electric, driverless cars will operate as public transport vehicles.

9. The city will be connected to other locations by a network of roads and railways.

10. Energy will be provided by solar power and wind farms.

11. A desalination plant will be used to provide the city's water.

12. 80% of water used being recycled, and industrial waste will be recycled.

13. all students at the Masdar Institute of Science and Technology.

14. Finding solutions to the world's energy problems.

15. Many global, environmental and conservation organisations.

16. It is felt that, instead of building an artificial sustainable city, sustainability should be made priority of existing cities.

17. **which:** Megaprojects

**They:** megaprojects

**it:** a megaproject

**it:** Masdar City

**whose:** a university

**it:** the project

**It:** that, instead of building an artificial sustainable city, sustainability should be made priority of existing cities.

**that:** a blueprint for future urban planning

18. Examples of projects include motorways, airports, stations, tunnels, bridges and entire city complexes.

19. The advantages include the fact that it will be the world's first carbon-neutral, zero-waste city. It will also be a car-free zone, although there will be excellent public transport. The disadvantage is that existing cities are nowhere near as environmentally clean, and many people think the money should have been spent on cleaning up existing places and making them more sustainable.

20. Students' own answers

21. Suggested answer

I think that a megaproject like Masdar City would be very successful in Jordan: it would encourage investment in the country and benefit the population by providing an environmentally-friendly space for people to live in. However, we would have to be careful not to overshadow the natural beauty of our country with too much building: we would have to find the perfect balance between modernity and nature.

(11)

2016 شتوية

This essay discusses Masdar City, which is an example of a "megaproject". Megaprojects are extremely large investment projects, which are designed to encourage economic growth and bring new benefits to cities. Megaprojects vary in terms of size and cost.

The concept of a megaproject is always based on the benefits it brings to a community. However, many megaprojects have been criticised because of their negative effects on a community or the environment.

Masdar City, which began its development in 2006 CE, will be the world's first carbon-neutral, zero-waste artificially-created city. Covering an area of six square kilometres, when it is completed in 2025 CE. The current residents of Masdar City are all students at the Masdar Institute of Science and Technology.

The city will run entirely on renewable energy sources. It is built on an advanced energy grid which monitors exactly how much electricity is being used by every outlet in the complex. Furthermore, in order to reduce its carbon footprint, Masdar City will be a car-free zone, designed to be pedestrian and cycle-friendly. Also, electric driverless cars will operate as public transport vehicles.

While the project has the support of many global, environmental and conservation organisations, there is some criticism of it. It is felt that, instead of building an artificial sustainable city, sustainability should be made priority of existing cities.

In conclusion, the benefits of Masdar City for the community and the environment greatly outweigh any disadvantages. If the aims of the developers are realised, Masdar City will be a blueprint for future urban planning that will inspire similar megaprojects in other countries.

1. There are many procedures that will be implemented to reduce carbon footprint in Masdar City. Write down two of these procedures. (4 points)
2. The writer states two benefits of creating megaprojects. Write them down. (2 points)
3. What does the underlined word "outweigh" mean? (2 points)
4. Quote the sentence which shows who are the present inhabitants of Masdar City. (3 points)
5. What does the underlined word "their" refer to? (2 points)
6. "Making use of renewable energy sources has its own positive impacts on community and environment". Suggest three positive impacts on community and environment to show how far you agree with this statement. (3 points)

7(12)

7. Some people argue that we should prioritise sustainability in already existing cities rather than, creating new one. Think of this statement and, in two sentences, write down your point of view. (2 points)

### ANSWERS

1. Any two of the following:

1. the city will run entirely on renewable energy sources.
2. Masdar City will be a car – free zone.
3. designed to be pedestrian and cycle-friendly.
4. Electric, driverless cars will operate as public transport vehicles.
5. It is built on an advanced energy grid which monitors exactly how much electricity is being used by every outlet in the complex.

2. a. to encourage economic growth.      b. bring new benefits to cities.

3. to be more important than something else.

4. The current residents of Masdar City are all students at the Masdar Institute of Science and Technology.

5. many megaprojects

6. suggested answer:

1. stabilizes energy price.
2. reduces the cost of many products.
3. increases the local services.
4. requires less maintenance.
5. does not cause pollution.

**Or any relevant answer**

7. suggested answers:

1. conserving natural resources.
2. improving existing infrastructure
3. building green districts
4. increasing use of sustainable transport
5. making cities cleaner and greener

**Or any relevant answer**

(13)

Megaprojects are extremely large investment projects, which are designed to encourage economic growth and bring new benefits to cities. Although megaprojects vary in terms of size and cost, they are all, by definition, expensive, public projects that attract a high level of interest and media coverage. Projects range from motorways, airports, stations, tunnels, bridges, etc. to entire city complexes.

Many megaprojects, such as Masdar City, a megaproject in Abu Dhabi, have been criticised because of their negative effects on a community or the environment.

Energy will be provided by solar power and wind farms, and there are also plans to build the world's largest hydrogen plant. Biological waste will be used as an energy source too, and industrial waste will be recycled.

In conclusion, the benefits of Masdar City for the community and the environment greatly outweigh any disadvantages. If the aims of the developers are realised, Masdar City will be a blueprint for future urban planning that will inspire similar megaprojects in other countries.

1. Certain power resources will supply Masdar City with energy. Write down two of these resources. (2 points)
2. The text provides many examples of megaprojects. Write down two of these megaprojects. (4 points)
3. Find a word in the text which means "to be more important than something else" (2 points)
4. Quote the sentence which shows the main reason to criticize megaprojects. (3 points)
5. What does the underlined word "they" refer to? (2 points)
6. Projects similar to Masdar City would be successful in Jordan. Write down three facilities that are available in Jordan and would improve the project. (3 points)
7. The construction of Masdar City is sometimes considered disadvantageous for the citizens as well as the environment. Think of this statement and, in two sentences, write down your point of view. (2 points)

1. Name two of Ibn Bassal's achievements.  
.....
2. Find a verb in the second paragraph that means 'supply land with water'.  
.....
3. Guess the meaning of 'fertile land' in the third paragraph. Which part of the text illustrates its meaning?  
.....
4. Guess the meaning of 'legacy' in the third paragraph. What does the author suggest is Ibn Bassal's legacy to the world?  
.....
5. Which paragraph suggests that Ibn Bassal was a polymath? Give examples of his areas of knowledge.  
.....
6. Why do you think the area around Toledo had a 'fast-growing population'?  
.....
7. Quote the sentence which indicates that Ibn Bassal was greatly interested in the study of plants.  
.....
8. Write down the sentence which indicates that Ibn Bassal was a polymath.  
.....
9. Despite being a scholar, Ibn Bassal also had his own hands-on experience of working the land, what do you think this added to his writings about plants and agriculture?  
.....
10. What information does Ibn Bassal's book "*A Book of Agriculture*" contain?  
.....
11. Ibn Bassal designed two things related to watering plants and trees. Write these two things down.  
.....
12. There were two beneficial results for following Ibn Bassal's instructions and advice by farmers down the generations. Mention these two results.  
.....
13. Write down the sentence which indicates that Ibn Bassal's systems of irrigation are still existent in Spain nowadays.  
.....
14. Write down the sentence which indicates that Ibn Bassal left a great legacy to the world despite being not widely famous.  
.....
15. What do the underlined words refer to?  
.....

## Answers

1. writing *A Book of Agriculture*; designing water pumps and irrigation systems
2. irrigate
3. agriculturally productive; 'produced more than enough food ...' (lines 28–29)
4. 'Legacy' means what someone leaves to the world after their death. Ibn Bassal's legacy is his agricultural instructions and advice.
5. the first paragraph: writing, science, engineering, botany, agriculture
6. **Suggested answer:**  
I think that the area around Toledo had a fast-growing population for two reasons. Firstly, I think that many people would want to live around Toledo, and Al-Andalus in general, at that time because Al-Andalus was a very prosperous place. Secondly, because the area was producing a lot of food as a result of Ibn Bassal's irrigation systems, people would be healthier and more able to provide for more children than they could before.
7. His great passions were botany, which is the study of plants, and agriculture.
8. Ibn Bassal was a writer, a scientist and an engineer who lived in Al-Andalus in the eleventh century CE.
9. Open answer
10. It explains how best to grow trees, fruit and vegetables, as well as herbs and sweet-smelling flowers; it describes how to treat different types of soil.
11. He designed water pumps and irrigation systems.
12. The land became wonderfully fertile and produced more than enough food for the fast-growing population.
13. The irrigation systems that he and his followers put in place are still in evidence in Spain.
14. Although his name is not widely known, Ibn Bassal's legacy to the world has been great.