The invention of the microwave oven

Dr. Percy Spencer invented the microwave oven. The invention happened by accident. Dr. Spencer was an engineer. In 1946 he was doing radar research with magnetrons. Magnetrons produce microwave radiation. One day at work he noticed that the chocolate bar in his pocket had melted. He realized that the microwaves from a magnetron had melted the chocolate.

Dr. Spencer wanted to do more experiments. He immediately bought a bag of popcorn. He put it in front of a magnetron. When he checked it two minutes later, all the popcorn had popped! Dr. Spencer had created the first microwave popcorn snack! He was very excited because he had discovered that microwaves cook things more quickly than normal ovens. Other scientists had noticed the same phenomenon before Dr. Spencer, but they hadn’t understood the potential of the discovery. So it was thanks to Dr. Spencer that microwave ovens were soon available to the public in stores.

a. Other scientists saw the effect of magnetrons.

b. The chocolate bar melted.

c. Dr. Spencer put a chocolate bar in his pocket.

d. He put popcorn in front of a magnetron.

e. He checked the popcorn.

f. The popcorn popped.

g. Dr. Spencer was excited about his discovery.

h. He saw the melted chocolate.
2 Read and complete the grammar box.

We use the **past perfect** to say that something happened **before** another action or event in the past. To form the past perfect we use *had (not) + the past participle*:

- 2nd event = simple past
- 1st event = past perfect

*He noticed that the chocolate bar in his pocket had melted.*

**Affirmative**

He *realized* that the microwaves *had melted* the chocolate.  
When he *checked* it, all the popcorn __________ popped.  
Dr. Spencer *had* ________ the first microwave snack.

**Negative**

Other scientists *hadn’t understood* the potential.

3 Read and number the events ‘1’ and ‘2’ in the order they happened.

a Dr. Spencer *realized* the microwaves *had melted* the chocolate.  
   - 2

b He *put* popcorn in front of the magnetron because he *had seen* the chocolate melt.  
   - 1

c The popcorn *had popped* when he *checked* it.  
   -

d When he *got* his first job in a factory, Spencer *had* just *finished* 5th grade at school.  
   -

e He *had been* an electrical engineer for many years when he *made* his discovery.  
   -

f Before Dr. Spencer *made* his discovery, people *hadn’t used* microwaves for cooking.  
   -
Listen and complete the sentences.

a Dr. Alexander Fleming discovered penicillin in 1928.

b At the time he was a ________ researcher.

c Dr. Fleming’s laboratory was often ________.

d During his vacation, he had left the bacteria cultures on a ________ in the laboratory.

e He saw that ________ had developed on one of the dishes.

f He noticed that the mold had stopped the ________ from growing.

g Fleming had seen ________ die of dangerous bacteria during World War I.

h Fleming knew he had discovered something really ________.

2 Complete the sentences with the verbs in the past perfect.

a Green mold ________ developed (develop) when Fleming returned from vacation.

b When he found the mold, he ____________ (be) away for more than two weeks.

c He realized the mold ____________ (kill) the bacteria in the dish.

d He made the discovery because he ____________ (not clean) the laboratory equipment.

e He ____________ (leave) the dish on a table when he went on vacation.

f Fleming ____________ (work) in his London laboratory for several years when he made the discovery.

g Fleming was well known before his discovery, because he ____________ (be) a successful medical researcher.

h Other scientists ____________ (notice) the same phenomenon before Fleming, but they ____________ (not realize) its significance.
3. Complete the text with the correct form of the verbs in the box.

freeze  leave  fall  invent  send  want  invent  make

More accidental discoveries and inventions

The popsicle (1905)
When 11-year-old Frank Epperson woke up one morning he remembered he (a) **had left** his favorite drink in the yard the night before. It had a stirring stick in it. That night, temperatures (b) **fell** well below freezing. When Frank went outside he discovered that the drink (c) **froze**. He (d) **invented** the first fruit-flavored popsicle!

Potato chips (1853)
Chef George Crum created potato chips because he was angry! He (e) **sent** French fries for a customer, but the customer (f) **sent** them back. He said they were too thick and soft. So Crum cut very thin slices of potato and cooked them until they were crisp. He (g) **wanted** to take revenge, but the customer loved them! Crum (h) **invented** potato chips!

Adverbs like just and already go after had: He had just woken up.

4. Use the prompts to write sentences.

a. Before we read the article we / not hear / of Frank Epperson
   Before we read the article we hadn’t heard of Frank Epperson.

b. Frank / just / wake up / when he remembered his drink

   Frank had just woken up when he remembered his drink.

c. George Crum was angry because a customer / complain / about his fries

   George Crum was angry because a customer complained about his fries.

d. People / not try / potato chips until Crum invented them

   People didn’t try potato chips until Crum invented them.

e. He was surprised because he / not expect / the customer to like them

   He was surprised because he didn’t expect the customer to like them.
Read the article. What did Howard Carter discover?

In 1922, the archeologist Howard Carter was working in the Valley of the Kings in Egypt. He hoped to find a pharaoh’s tomb. Important archeologists had said there was nothing more to find, but Carter continued to look. While they were digging, they made an incredible discovery. They found the tomb of an unknown ancient Egyptian ruler called Tutankhamen. No one had entered the tomb for over 3,000 years!

When Carter first looked through the door, he saw a room full of gold objects. When he died 17 years later, he had recovered more than 3,500 priceless objects from the tomb, and he had become as famous as Tutankhamen himself.

We use different narrative tenses in stories to describe past events.

<table>
<thead>
<tr>
<th>Simple past</th>
<th>They found the tomb of an Egyptian ruler.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past perfect</td>
<td>No one had entered the tomb for over 3,000 years!</td>
</tr>
<tr>
<td>Past progressive</td>
<td>In 1922, he was working in Egypt.</td>
</tr>
</tbody>
</table>

2 Circle the correct words.

a. When Howard Carter found the tomb, he worked / had worked in Egypt for 31 years.

b. While he dug / was digging, he saw a step that someone had cut / was cutting into the rock.

c. Carter sent a telegraph to announce that he discovered / had discovered something important.

d. Carter found evidence that robbers tried / had tried to enter the tomb, but they had not been / weren’t being successful.
Write the verbs in the correct narrative tense. Listen and check.

In 2012, a treasure hunter (a) **discovered** (discover) 30,000 silver and gold coins, and some jewelry while he (b) **searched** (search) a field in the United Kingdom. Ronald Gray (c) **had** (have) a cheap metal detector which he (d) **bought** (buy) three months earlier. The treasure he found was one of the largest collections of Celtic coins and jewelry anyone (e) **ever found** (find). Experts in Celtic history (f) **said** (say) the coins were at least 2,050 years old.

Mr. Gray chose that particular field because he (g) **heard** (hear) stories about other people finding old coins there. While he (h) **used** (use) his metal detector it (i) **started** (start) making a lot of noise. He dug for 30 minutes. When he stopped, he (j) **found** (find) 60 coins. He (k) **hurried** (hurry) back to the store that (l) **sold** (sell) him the metal detector and he (m) **bought** (buy) a better, more powerful model. When the day ended, he (n) **uncovered** (uncover) at least 120 coins.

Expand the prompts to write an article in your notebook. Use narrative tenses.

In 2013, a treasure hunter discovered...

- In 2013 / treasure hunter / **discover** (discover) / gold plate / while she / **dive** (dive) / off the Florida coast
- Mary Fisher / **look** (look) for / the wreck of a Spanish ship when she / **find** (find) / the plate
- She / **be** (be) / in the water for 30 minutes / when she / **see** (see) / something bright in the sand
- She / **be** (be) / excited because she / **not find** (not find) / anything like it before
- She / **take** (take) / it to a Florida museum the next day
- While they / **clean** (clean) / it they / **announce** (announce) / that it was worth $1 million dollars