天文、气象、气候

1.Martian Gravity	
Located at the **NASA** (美国航空和航天局) Research Center	爱荷华州（中西部）
in **Iowa** is a 5,000-gallon **vat** of water, and inside the tank is	n. 大桶
an underwater **treadmill** designed by Dava Newman, an	n. 踏车
aerospace engineer.	n. 航空宇宙
For four years Newman observed **scuba** divers as they	n. 水中呼吸器
simulated walking on the Moon and on Mars on her	v. 模拟
underwater moving belt. She wanted to discover how the	
gravity of the Moon and of Mars would affect human	n. 重力
movement. To do this, Newman attached weights to the	
divers and then **lower**ed them into the tank and onto the	v. 放下
treadmill. These weights were carefully **adjusted** so that the	adj. 调整过的
divers could experience underwater the gravity of the Moon	
and of Mars as they walked on the treadmill. Newman	
concluded that walking on Mars will probably be easier than	
walking on the Moon. The Moon has less gravity than Mars	
does, so at **lunar** gravity, the divers struggled to keep their	adj. 月球的月亮的
balance and walked **awkwardly**.	adv. 笨拙地
But at **Martian** gravity, the divers had greater **traction** and	adj. 火星的
stability and could easily adjust to a pace of 1.5 miles per	n. 牵引
hour. As Newman gradually increased the speed of the	
treadmill, the divers took longer, graceful **stride**s until they	v. 大步走
comfortably settled into an even quicker pace. Newman also	
noted that at Martian gravity, the divers needed less **oxygen**.	n. 氧气
The data Newman collected will help in the future design of	
Martian **space suits**. Compared to lunar space suits,	n.航空服
Martian space suits will require smaller **air tank**s; and, to	n. 氧气筒
allow for freer movement, the **elbow** and knee areas of the	n. 肘
space suits will also be **alter**ed.	v 修改、改变

2. Space Suit

Thank you. It's great to see so many of you interested in this	
series on "Survival in **Outer Space**." Please excuse the	n. 系列/n.外太空
cameras, we're being **videotape**d for the local TV stations.	v. 摄像
Tonight I'm going to talk about the most basic aspect of	
survival—the **space suit**. When most of you imagine an	n. 太空服
astronaut, that's probably the fist thing that comes to mind,	n. 宇航员
right? Well, without space suits, it would not be possible for	
us to survive in space. For example, outer space is a	
vacuum—there's no gravity or air pressure; without	n. 真空
protection, a body would **explode**. What's more, we'd cook	v. 爆炸
in the sun or freeze in the **shade** with temperatures **ranging**	n. 黑暗、阴暗
from a toasty 300 degrees above **to** a cool 300 degrees	范围为从...到...
below zero **Fahrenheit**.	n. 华氏温度
The space suit that NASA has developed is truly a **marvel**.	n. 奇迹
This photo enlargement here is a **life-size** image of an	adj. 真实大小的
actual space suit worn by astronauts on the last **space**	航天飞机
shuttle mission. This part is the torso. It's made of seven	
extremely durable layers. This thick **insulation** protects	n. 绝缘
against temperature extremes and **radiation**. Next is what	n. 放射、辐射
they call a "bladder" of oxygen that's an **inflatable sac**, filled	adj.膨胀的/n.液囊
with oxygen, to simulate **atmospheric** pressure. This	adj. 大气的
bladder presses against the body with the same force as the	
Earth's atmosphere at sea level. The **innermost** layers	adj. 最里面的
provide liquid cooling and **ventilation**. Despite all the layers,	n. 通风
the suit is **flexible**, allowing free movement so we can work.	adj. 柔韧的灵活的
Another really **sophisticated** part of the space suit is the	adj. 精密的老练的
helmet. I brought one along to show you. Can I have a	n. 头盔
volunteer come and **demonstrate**?	v. 示范

3. Astronomer

Most people think of **astronomer**s as people who spend their time in cold observatories peering through **telescope**s every night. In fact, a typical astronomer spends most of his or her time analyzing data and may only be at the telescope a few weeks of the year. Some astronomers work on **purely** theoretical problems and never use a telescope at all. You might not know how **rarely** images are viewed directly through telescopes. The most common way to observe the skies is to **photograph** them. The process is very simple. First, a photographic plate is **coated** with a **light-sensitive material**. The plate is positioned so that the image received by the telescope is recorded on it. Then the image can be developed, **enlarge**d, and published so that many people can study it. Because most **astronomical** objects are very remote, the light we receive from them is rather **feeble**. But by using a telescope as a camera, long time **exposure**s can be made. In this way, objects can be photographed that are a hundred times too **faint** to be seen by just looking through a telescope.

n. 天文学家
n. 望远镜
adv.纯粹地完全地
adv. 罕有地
v. 拍照
adj. 涂上一层的
感光材料
v. 放大
Adj.天文的
adj. 微弱的
n. 曝光
adj. 微弱的暗淡的

4. Earth's shape

In ancient times, many people believed the earth was a **flat disc**. Well over 2,000 years ago, the ancient Greek philosophers were able to **put forward** two good arguments proving that it was not.	adj. 平的 n. 圆盘 v. 提出
Direct observation of **heavenly bodies** was the basis of both these **argument**s. First, the Greeks knew that during **eclipse**s of the moon, the earth was between the sun and the moon, and they saw that during these eclipses, the earth's **shadow** on the moon was always round, they realized that this could be true only if the earth was **spherical**. If the earth were a flat disc, then its shadow during eclipses would not be a perfect circle, it would be stretched out into a long **ellipse**. The second argument was based on what the Greeks saw during their travels. They noticed that the North Star, or **Polaris**, appeared lower in the sky when they traveled south, in more northernly regions, the North Star appeared to them to be much higher in the sky. By the way, it was also from this difference in the apparent position of the North Star that the Greeks first calculated the **approximate** distance around the **circumference** of the earth, a figure recorded in ancient documents says 400,000 **stadia**, that's the plural of the word **stadium**. Today, it's not known exactly what length one stadium represents, but let's say it was about 200 meters, the length of many **athletic** stadiums. This would make the Greek's estimate about twice the figure accepted today, a very good estimate for those writing so long before even the first **telescope** was invented.	n. 天体 n. 论点、观点 n. 月食 n. 阴影 adj. 球状的 n. 椭圆（形） n. 北极星 adj. 大约的近似的 n. 圆周，周围 stadium 的复数 n. 体育场 adj. 运动的 n. 望远镜

5. Climatic Shift

Today I want to talk about the Earth's last major **climatic shift**, at the end of the last ice age. But first, let's back up a moment and review what we know about climatic change in general. First, we defined "climate" as consistent patterns of weather over significant periods of time. In general, changes in climate occur when the energy balance of the Earth is **disturb**ed. **Solar energy** enters the Earth's atmosphere as light and is radiated by the Earth's surface as heat. Land, water, and ice each affect this energy exchange differently. The system is so complex that, to date, our best computer models are only **crude** approximations and are not sophisticated enough to test hypotheses about the causes of climatic change. Of course, that doesn't keep us from speculating. For instance, **volcanic** activity is one **mechanism** that might affect climatic change. When large volcanoes **erupt**, they **disperse** tons of particles into the upper atmosphere, where the particles then reflect light. Since less light is entering the system of energy exchange, the result would be a **cooling** of the Earth's surface. Of course, this is just one possible mechanism of global climate change. In all **probability**, a complete explanation would **involve** several different mechanisms operating at the same time.

n. 气候变化
v. 扰乱
n. 太阳能
adj.粗糙的拙劣的
adj. 火山的
n. 机制
v. 散开、传播
n. 冷却
v. 长肥
n. 概率
v. 包括

6. Tornado	
The winds of a **tornado** are the most violent and **destructive** ones on Earth. Any of you who have seen one knows very well how frightening and powerful they are. What's interesting about them is that scientists don't actually know exactly why tornadoes occur. We do know, however, what happens when tornadoes are formed. As you remember, a **front** occurs when cool, dry air from the north meets warm, **humid** air coming from the south, from the **Gulf of Mexico**, for tornadoes in the United States. Where these air masses meet, a narrow zone of storm clouds develops, and **thunderstorm**s, and sometimes tornadoes, occur. How is this violent weather produced? Well, a mass of warm, humid air rises very rapidly. As it rises, more warm air rushes in to **replace** it. This **inrushing** air also rises, and in some cases, especially when there is extreme **thermal instability**, begins to **rotate**. When this happens, the rotating air **form**s a tornado. Even if you've seen tornadoes only in movies, you know that they can **demolish** buildings in seconds. This is possible because when a tornado passes over a house, it **suck**s **up** air from around the house and so the **air pressure** outside the house drops rapidly. Inside, pressure remains the same. So, air pressure inside is greater than air pressure outside. The result is that the building **explode**s **outward**. Next, we'll talk a little bit about how new technological developments are being used to try to predict tornadoes.	n. 龙卷风 adj. 破坏性的 adj. 令人恐惧的 adj. 湿润的 墨西哥湾 n. 雷暴 v. 取代 adj. 大批涌进的 热不稳定性 v. 旋转 v. 形成 v. 毁坏 吸收 n. 气压 n. 断层 向外爆炸