# **第四单元 科学与文化论著研习——求真求实**

**单元目标**

1.研读本单元三篇文章，掌握阅读自然科学论著的一般方法，注意抓住关键概念，厘清思路，把握逻辑，理解文章内容。

2.结合具体文本，体会自然科学论著的语言特点，熟悉自然科学论著的表达方式。

3.了解科学研究中对各种逻辑思维方式的综合运用，学习科学的研究方法，感受不同科学领域研究方法的异同。

4.学会用恰当的方式呈现自己的学习成果，撰写内容摘要、读书报告，及时记录研究心得，学习查找科技文献的基本方法并尝试运用。

## **第13课 自然选择的证明 \*宇宙的边疆**

**课时目标：**

1.理解文章基本观点和文章各部分之间的关系，把握整体思路，体会严密的论辩逻辑。

2.抓住文中的重要概念，明确概念之间的联系，理解文中事实、规律、结论的逻辑关联。

3.把握学术论著和科普作品在表达技巧、语言风格等方面的异同。

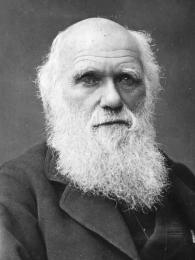
4.了解文章中介绍的科学知识，感受文中所体现的理性、严谨的科学精神。

### **课时1 自然选择的证明**

#### **自主学习·悟新知**

**一、作者名片**

达尔文（1809—1882），全名查尔斯·罗伯特·达尔文，英国博物学家，进化论的奠基人。达尔文从小就爱采集矿物和植物标本。1831年毕业于剑桥大学，同年参加环绕世界的考察航行。其后，他在多病的情况下坚持整理了考察中收集的大量资料，陆续发表了有关生物学及地质学的考察报告。1859年11月24日出版的《物种起源》，充分论证了生物在不断进化的观点，在社会上引起极大反响。达尔文善于运用科学考察得来的事实，阐述生物进化的一般原理，并进行分析和推论，论证严密。



代表作品：《物种起源》《动物和植物在家养下的变异》《人类的由来》等。

**二、写作背景**

1831年，剑桥大学植物学教授亨斯洛推荐达尔文参加贝格尔舰环绕世界的考察航行。这次考察航行彻底改变了达尔文的一生，使他在生物学研究上更进了一步。达尔文跟随贝格尔舰先在南美洲东海岸的巴西、阿根廷等地和西海岸及相邻的岛屿上考察，然后跨太平洋至大洋洲，继而越过印度洋到达南非，再绕好望角经大西洋回到巴西，最后返抵英国。达尔文沿途考察各地的地质、动植物的特性，采集了无数的标本，并做了详细的观察笔记。在环球航行的过程中，他发现每个地区都存在着既相似又不一样的物种，还发现有些地区环境相似，但是物种不同。这些发现让达尔文更加坚定了研究生物特性的决心。1842年，达尔文完成了《物种起源》的提纲，经过不懈努力，终于在1859年出版了《物种起源》。

**三、知识链接**

**《物种起源》**

《物种起源》的全名是《论依据自然选择即在生存斗争中保存优良族的物种起源》，1859年11月在伦敦出版。在书中，达尔文根据20多年积累的对古生物学、生物地理学、形态学、胚胎学和分类学等许多领域的大量研究资料，以自然选择为中心，从变异性、遗传性、人工选择、生存竞争和适应等方面论证物种起源和生命自然界的多样性与统一性。《物种起源》不仅开创了生物学发展史上的新纪元，使进化论思想渗透到自然科学的各个领域，而且引起了整个人类思想的巨大革命，在世界历史进程中有着广泛而深远的影响。

**四、语言基础**

1．**读准字音**

① 驯养（ ）

② 蹼状（ ）

③ 蝙蝠（ ）

④ 姬蜂（ ）

⑤ 栖息（ ）

⑥ 迁徙（ ）

【答案】① xùn

② pǔ

③ biān

④ jī

⑤ qī

⑥ xǐ

2．**写对字形**

①

②

【答案】① 捕；哺；脯；铺

② 殖；值；植；缜；嗔

3．**辨析词义**

界限·界线

**辨析** 二者都可指“不同事物的分界”。“界限”常用于抽象事物，还可以指尽头处、限度，侧重指某种限制、范围或标准。“界线”常用于具体事物，多指两个地区分界的线，它是一个具体的划分点，用于将不同的领域或空间隔离开来。

**应用** 虽然大海茫茫无际,但是海上领域是用经纬线划分的,像陆地\_ \_ \_ \_ 一样清晰,不能越过分毫。

【答案】界线

4．**积累成语**

请根据词义，在横线上填写恰当的课内成语。

① \_ \_ \_ \_ \_ \_ \_ \_ ：形容头绪繁多,情况复杂。

② \_ \_ \_ \_ \_ \_ \_ \_ ：（学习、工作）按照一定的步骤逐渐深入或提高。

③ \_ \_ \_ \_ \_ \_ \_ \_ ：形容对于不足为奇的事情过分惊讶。

④ \_ \_ \_ \_ \_ \_ \_ \_ ：无法一个一个全举出来，形容同一类的人或事物很多。

⑤ \_ \_ \_ \_ \_ \_ \_ \_ ：不能有一点点缺失。

⑥ \_ \_ \_ \_ \_ \_ \_ \_ ：不值得奇怪，形容事物或现象很平常。

⑦ \_ \_ \_ \_ \_ \_ \_ \_ ：完善精美而没有缺点不足。

【答案】① 错综复杂

② 循序渐进

③ 大惊小怪

④ 不胜枚举

⑤ 不可或缺

⑥ 不足为怪

⑦ 完美无缺

5．**压缩语段**

将下面一段文字进行压缩。要求：①保留关键信息，压缩成一段更为简洁的说明性文字；②抓住说明对象的特征，进行举例说明；③表达流畅；④65个字左右。

在一定程度上，我们可以理解为什么自然界处处充满着美，这很大一部分应归功于自然选择。美对于人们的感官来说并不是无处不在的，人们只要见到过某些毒蛇，某些鱼类，或一些丑得像扭歪的人脸那样的蝙蝠，他就会承认这一点。性选择给了雄性以最鲜艳的色泽、优美的体态和其他华丽的装饰。有时在许多鸟类、蝴蝶和别的动物中，雌雄两性都是如此。拿鸟类来说，性选择使雄鸟的鸣叫声不仅取悦了雌鸟，同时也给人类以一种莫大的享受。花和果实由于有绿叶相衬，其色彩更为艳丽、醒目，更易被昆虫发现、光顾并传粉，而种子也会被鸟类散布开去。

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】（示例）自然界的美大部分应归功于自然选择：性选择给了雄性一些优点，如取悦了雌鸟的雄鸟的悦耳的鸣叫声，更易被昆虫发现、光顾和传粉的花和果实艳丽、醒目的色彩。

【解析】这是一个说明性的语段，说明对象是“自然选择”。这段文字共六句话：第一句，提出观点“自然界处处充满着美，这很大一部分应归功于自然选择”；第二句，反面说明自然界的美并非无处不在的；第三句，指出雄性因性选择获得了一些优点；第四句，将其扩展到雌雄两性；第五句，用鸟类来举例说明；第六句，用花和果实来举例说明。这段话可以分为三层，第一层说明观点，第二层说明事物的特征，第三层举例说明。这样，就可以归纳概括要点。如由第一、二句可概括出“自然界的美大部分应归功于自然选择”，第三、四句可概括出“性选择给了雄性一些优点”，第五、六句可概括出“取悦了雌鸟的雄鸟的悦耳的鸣叫声”“更易被昆虫发现、光顾和传粉的花和果实艳丽、醒目的色彩”。

**语用知识**

压缩语段——说明性语段

说明性语段指对一段文字进行介绍时主要采用了说明的表达方式。说明性语段往往层次清晰、结构分明，因此在压缩语段时为确保全面并且不遗漏要点，可运用“层次切分”法，明确说明对象，并把握其特点。具体步骤如下：

第一步：审清题干要求，找准语段的说明对象。

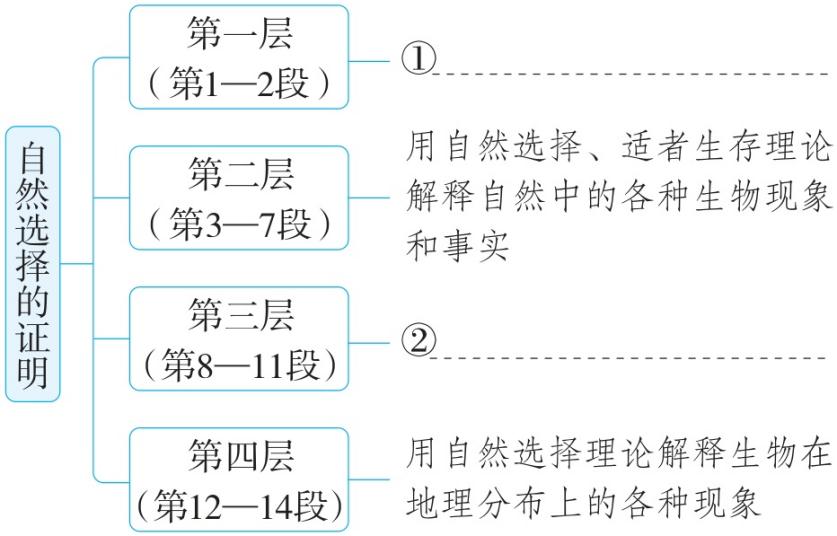
第二步：分析语段共涉及哪些方面，并准确、简要地概括归纳（切分层次，提取层次要点）。

第三步：①抓住说明对象的特征，即说明对象的性质、特点、成因、作用、功能等；②筛选保留主要信息，删除次要信息；③对需要概括的信息，进行准确、全面的概括归纳；④合并概括出信息要点。

第四步：自我检查，推敲表述，确保语句通顺、连贯、清晰、不改变原意。

**五、文意梳理**

1．**厘清结构**



【答案】明确提出自然状况下的变异是自然选择的结果； 解释自然选择学说面临的一些疑问

2．**概括主旨**

本文谈了①\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ 中所表现出来的适者生存现象，用大量通过②\_ \_ \_ \_ \_ \_ \_ \_ 所得到的事实论述了有关生物进化的基本法则，表现了作者③\_ \_ \_ \_ \_ \_ \_ \_ 的科学精神。

【答案】①生物进化论； 科学考察； 严谨求实

#### **合作探究·提能力**

**情境探究**

许多老师和同学认为《自然选择的证明》是高中阶段最难读懂的文章之一。其难懂的原因主要有以下几点：一是文中存在大量科学专业术语和概念，提高了理解门槛；二是理论性过强，内容表述抽象；三是文章内容丰富、篇幅较长，让人无法厘清思路。

鉴于此，班内计划举办一场“自然科学论著阅读方法谈”报告会。为在报告会上与同学们更好地交流“如何阅读自然科学论著”这一话题，你需要围绕该话题撰写论文提要。

###### **任务一 明确概念，理解观点**

1．文中的两个重要概念分别是什么？说一说你对这两个概念的理解。（6分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】全文主要围绕“生物变异”“自然选择”两个概念展开论述。（2分）①生物变异：不加人工控制，生物个体在自然情况下发生的变异，包括遗传的变异和不遗传的变异。（2分）②自然选择：生物在生存斗争中适者生存、不适者被淘汰的现象。（2分）

2．关于生物的起源和进化,本文阐明的观点是什么?请简要概括。（4分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】自然条件下物种能够发生变异,产生变种；特征显著而稳定的变种会逐步发展成新的物种。（2分）生物通过自然选择,适者生存,择优弃劣。（2分）

###### **任务二 赏析语言，分析论证**

3．本文的语言准确、严密、清晰、明了。请分析下列句子中的加点部分。（4分）

（1） 我们可望在自然条件下看到生物的变异。（2分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

（2） 在一定程度上，我们可以理解为什么自然界处处充满着美，这很大一部分应归功于自然选择。（2分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】（1） ①“可望”是“可以指望，有希望”的意思.②说明自然条件下生物的变异并没有确凿的证据，只是有这种可能，用“可望”符合实际情况。（每点1分）

（2） ①“在一定程度上”“很大一部分”分别表示程度和范围。②作者运用这些短语体现了语言的准确性、严密性。（每点1分）

4．自然科学论著的语言讲求准确、严密，其中复杂的思路常常用长句来表述。请说说你对下面这个长句的理解。（2分）

由于每个物种都有按照几何级数过度繁殖的趋向，而且各个物种中变异了的后代，可以通过其习性及构造的多样化去占据自然条件下多种多样的生活场所，以满足数量不断增加的需要，所以自然选择的结果就更倾向于保存物种中那些最为歧异的后代。

答：\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】这是一个多重复句，最后一句是得出的结果，前几个分句是原因，分别从物种有过度繁殖的趋向、物种中变异的后代为满足数量不断增加的需要，通过各种手段占据生活场所等角度进行分析，使结论更有说服力。（2分）

**素养必备**

如何读懂长句

1.对于复杂的长句，要抓住句子的主要成分，把握主要结构，特别注意定语的修饰或限制作用。

2.对于多重复句，要梳理出句子的层次，逐层分析，正确把握各分句之间并列、递进、选择、顺承、转折、因果、假设、条件等逻辑关系，进而准确理解整个句子的意思。

5．本文主要运用了哪些论证方法？请结合课文内容简要说明。（4分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】①举例论证。列举自己在科学考察中发现的现象，如一种像啄木鸟形态的鸟却在地面上捕食昆虫。②道理论证。引用“自然界中没有飞跃”这一格言，证明自然选择学说的合理性。③对比论证。将自然选择学说、进化论能解释物种演化等自然现象与特殊创造行为学说不能解释进行对比，批驳了特殊创造行为学说，使自己的观点得到巩固。④因果论证。文中运用大量表示因果关系的句式，如“因为在物种形成很活跃的地方……”“由于……所以自然选择的结果……”“既然……所以某一地区的物种……”等。（每点1分）

###### **任务三 学会阅读，撰写提要**

6．科学论文发表时，一般都有提要或摘要，可以让读者迅速了解研究成果，也便于论文的归类、整理。请参考以上任务，为本文写一段提要。要求：思路清晰，表意明确，语言简练，术语规范，200个字左右。（10分）

答：\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】（示例）《自然选择的证明》以生物变异与自然选择为核心，通过地质、生物、地理等多维证据，构建严密的进化理论。文章阐释生物变异的本质，强调自然选择对物种适应与分化的驱动，以“适者生存”的逻辑贯穿论证。运用化石过渡形态对比、海岛生物分布分析等实证方法，结合假设推演，揭示物种起源动态过程。文章语言精准，限定词使用严谨，长句逻辑缜密，体现了科学论述的客观性。文章不仅颠覆了神创论，更确立了现代生物学基石，展现了自然史观的解释力与预见性。（思路清晰2分，表意明确2分，语言简练2分，术语规范2分，符合字数要求2分）

###### **思维发展与提升**

7．常言说：仁者见仁，智者见智。对达尔文在《物种起源》中提出的“物竞天择，适者生存”这一观点，你如何看待？请谈谈你的看法，并说明理由。（5分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】

（示例1）我赞同这个观点。世界上的生物从诞生的那刻开始，就经历着被环境选择的过程，这是谁都不能改变的。弱者，不可避免地要被淘汰。能在残酷的竞争中牢牢站稳脚跟的，才是真正的强者，它们经历了种种磨难，最终得以生存。正是所谓“物竞天择，适者生存”。

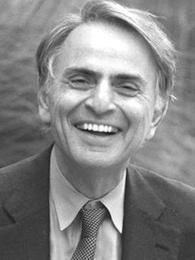
（示例2）我不赞同这个观点。“物竞天择，适者生存”，从自然生物的领域来说，更多的是在强调自然环境对物种繁衍与进化的影响。而在当今的社会环境中，人类对物种繁衍生息的影响已经越来越大，甚至对物种的繁衍生息起到了决定性作用。可以说，一个物种能否继续生存繁衍下去，与人类有着直接的关系。所以，“物竞天择，适者生存”的自然法则已经演变为“物竞人择，适者生存”。（明确观点1分，说明理由4分）

### **课时2 \*宇宙的边疆**

#### **自主学习·悟新知**

**一、作者名片**

卡尔·萨根（1934—1996），美国天文学家、科普作家。曾任美国天文协会行星科学学会、美国地球物理学联合会行星研究会、美国科学促进会行星学会的主席，并长期担任重要天文学杂志《伊卡洛斯》的主编。 他对人类将无人航天器发送到太空起过重要的作用，在行星科学、生命的起源、外星智能的探索方面也有诸多成就。他主持过电视科学节目，长期致力向大众普及科学知识，出版了大量科普书籍。其作品《伊甸园的飞龙》曾获得普利策奖，电视系列节目《宇宙》在全世界取得热烈反响。他对科学的精辟见解使他成为“唯一能够用简单扼要的语言说明科学是什么”的科学家。



代表作品：《宇宙联结》《宇宙》《布卢卡的脑》《暗淡蓝点》《数以十亿计的星球》等。

**二、写作背景**

1976年的夏秋，卡尔·萨根作为“海盗”号着陆舱模拟飞行队的成员，和科学工作队一起探索了火星。在人类历史上，宇宙飞船首次在火星着陆。这是令人瞩目的成就。然而由于报刊、电视等对其探索结果不闻不问，大众对此几乎一无所知。为此，他和“海盗”号资料分析及探索计划处处长一起制作了科教片《宇宙》，用生动活泼、通俗易懂的方式传播科学知识。60多个国家的观众观看了这部片子。同时，他还出版了与科教片同名的科普力作《宇宙》。在这本书中，萨根把世上万物融入宇宙宏大的背景下，用渊博的知识畅叙宇宙的形成，列举宇宙的进化，讴歌生命的诞生，并从宇宙观的高度审视人类社会，讨论人类在宇宙中的地位。

**三、知识链接**

**解说词**

解说词是对展览、实物、影视、图片、名胜古迹或历史文物等进行解释说明的一种文体。根据被解释的对象，解说词可分为文学性解说词和平实性解说词。用于参观、游览的导游解说词和用于电影、电视、风光片的解说词，多用散文手法，既有抒情又有解释说明，语言绚丽多彩，情感真挚浓郁。用于科普影片、新闻纪录片的解说词，则多运用朴实真挚的语言。

解说词的特点：①语言通俗、平易，读起来顺口，听起来顺耳；②紧扣实物和形象进行解说；③注重文艺性。

**科普文**

科普文属于说明文,目的是介绍科学知识、讲述科学道理。

科普文具有以下文体特征：

|  |  |
| --- | --- |
| **特征** | **阐释** |
| 内容的科学性 | 科普文提供的材料都应是科学准确的事实材料，且这些事实材料要经得起实践检验。 |
| 鲜明的思想性 | 科普文旨在传播科学知识，弘扬科学精神，以提高人们的科学素养和思想素质。 |
| 表意的通俗性 | 科普文一般采用明白晓畅的方式，深入浅出地介绍、解释科学内容。 |
| 语言的准确性 | 因介绍科学知识的需要，科普文语言需准确周密、科学严谨。以逻辑思维为基础，通过概念、判断、推理，在不断地说明、叙述中揭示事物的现象和本质，进而说明概念和结论。 |
| 生动的文学性 | 科普文语言具有一定的生动性和丰富性，有时会使用比喻、拟人等修辞手法进行形象的说明，甚至兼有议论、抒情等。 |

**四、语言基础**

1．读准字音

① 踝节（ ）

② 广袤（ ）

③ 椭圆（ ）

④ 璀璨（ ）

⑤ 甲烷（ ）

⑥ 氦气（ ）

【答案】① huái

② mào

③ tuǒ

④ càn

⑤ wán

⑥ hài

2．写对字形

①

②

【答案】① 栗；粟

② 覆；履

### **3.辨析词义**

**淹没·湮没**

**辨析** 二者都是动词，都含有“盖、没”的意思。“淹没”指（大水）漫过，盖过，比喻一事物遮掩住另一事物。多用于具体事物，被遮掩的事物依旧存在。“湮没”指埋没。多用于抽象事物，具有较浓的书面语色彩。

**应用** 98岁的老兵追忆当年的戎马生涯，眼前重现那一场被历史\_ \_ \_ \_ ，却对抗战成败十分重要的战斗。

【答案】湮没

4．**积累成语**

请根据词义，在横线上填写恰当的课内成语。

① \_ \_ \_ \_ \_ \_ \_ \_ ：只剩下微弱的一口气，形容临近死亡。

② \_ \_ \_ \_ \_ \_ \_ \_ ：（行人、车马等）像水流一样连续不断。

③ \_ \_ \_ \_ \_ \_ \_ \_ ：形容有才能的人很多。

④ \_ \_ \_ \_ \_ \_ \_ \_ ：不管条件是否许可，一心想做大事，立大功（多含贬义）。

⑤ \_ \_ \_ \_ \_ \_ \_ \_ ：形容气势雄壮。

【答案】① 奄奄一息

② 川流不息

③ 人才济济

④ 好大喜功

⑤ 气势磅礴

5．**下定义**

阅读下面的文字，给“星系”下定义。

从一个星系际的优越地位上，我们可以看到无数模糊纤细的光须像海水的泡沫一样遍布在空间的浪涛上，这些光须就是星系。其中有些是孤独的徘徊者，大部分则群集在一起，挤作一团，在大宇宙的黑夜里不停地飘荡。展现在我们面前的就是我们所见到的极其宏伟壮观的宇宙。我们隶属于这些星云，我们所见到的星云离地球80亿光年，处在已知宇宙的中心。

星系是由气体、尘埃和恒星群（上千亿个恒星）组成的，每个恒星对某人来说都可能是一个太阳。在星系里有恒星、行星，也可能有生物、智能生命和宇宙间的文明。

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】“星系”是由气体、尘埃和恒星群（上千亿个恒星）组成的，像海水的泡沫一样遍布在空间的浪涛上的无数模糊纤细的光须。

【解析】解答本题首先要找到被定义者的特征，如“无数模糊纤细的光须”“像海水的泡沫一样遍布在空间的浪涛上”“由气体、尘埃和恒星群（上千亿个恒星）组成”等，然后按照常规格式“被定义概念=种差+属概念”进行概括。

**语用知识**

下定义

“下定义”是一种用简洁明确的语言对事物的本质特征进行概括说明的方法。

公式：被定义概念=种差+属概念。①“种差”指同一属概念下的种概念所独有的属性，即和其他种概念的本质差别。②“属概念”指两个具有从属关系的概念中范围较大的那个概念。

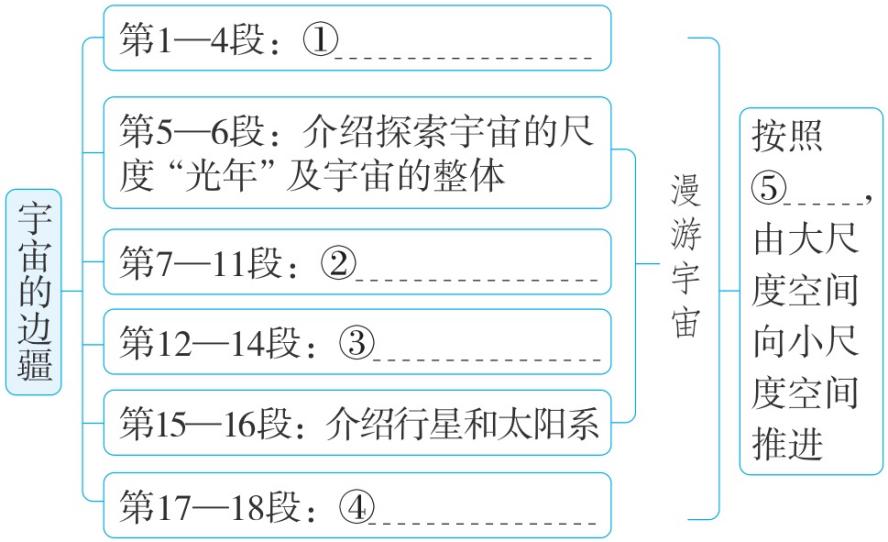
第一步：确定属概念，属概念隐藏在所给材料中，需要自己找出来；材料所给信息中没有现成的属概念时，需要根据材料的内容自己确定属概念。

第二步：寻找种差，即寻找那些属于被定义者的信息点，要注意有些种差是由多个属性组成的复杂属性，在提取相关信息时这些属性一个也不能少，否则会导致定义不严密。

第三步：整合成单句，将被定义概念、种差、属概念，用“是”“叫”等词连起来，使之符合“被定义概念=种差+属概念”的公式；确定陈述语序时，一定要仔细分析所给的材料，寻找其中的叙述顺序，是时间顺序还是空间顺序，抑或是逻辑顺序。

**五、文意梳理**

1．**厘清结构**



【答案】介绍人类探索宇宙的意义； 介绍星系； 介绍恒星； 回归地球； 空间顺序

2．**概括主旨**

本文通过对①\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ 的说明，向我们展示了②\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ 及天体的物理特征和遨游太空的收获，揭示了人类探索宇宙的重要意义，激发了世人③\_ \_ \_ \_ \_ \_ \_ \_ 的兴趣与献身宇宙科学、造福人类的勇气和斗志。

【答案】众多宇宙物质； 宇宙空间的奥秘； 探索宇宙

#### **合作探究·提能力**

**情境探究**

古往今来，人们对天空总抱有浪漫的想象与寄托，斗转星移，春秋代序，宇宙生生不息。屈原在《天问》中就有这样的疑问：“日月安属？列星安陈？”无垠的夜空，常引起人们无限的遐想。神秘的太空中有多少人类难解的谜？我们应该用什么样的方法去认识宇宙？今天，让我们跟随卡尔·萨根的脚步，走进《宇宙的边疆》，去了解、认识宇宙。

###### **任务一 理解文章内容，厘清介绍顺序**

1．联系全文，思考作者对宇宙有着怎样的认识。（5分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】①宇宙寥廓无垠，神秘莫测。“宇宙神秘非常，它有典雅的事实，错综的关系，微妙的机制”，是一个无限永恒的时空。任何行星、恒星或星系都只是宇宙中的一个地方，而不可能是“典型”的地方。②宇宙真空中，广袤、寒冷、荒芜。③整个宇宙中的自然法则都是一样的。④宇宙中很可能到处都充满着生命，必定有许多像地球一样的星球散布在整个宇宙空间中。⑤宇宙有无穷的奥秘，等待人类去探索。（每点1分）

2．

（1） 本文主要提到了哪些天文学概念？（2分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

（2） 本文的行文脉络是怎样的？这样安排的原因和好处是什么？（6分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】（1） 天文学概念：“天体”“星云”“星系群”“星系”“恒星”“黑洞”“行星”等。（2分）

（2） ①行文脉络：按照空间顺序，从宇宙的整体到星系的组成，再到太阳系，最后回到地球。②原因：从宇宙的演化角度来看，因为先有宇宙，次有星系，再有恒星，后有行星，所以作者也按这样的顺序介绍宇宙的构成；从摄影的角度来看，本文是科教片的解说词，先整体后局部便于观众把握。③好处：这样安排可以使读者跳出宇宙之外，将宇宙作为纯客观的说明对象来看待，能够更清晰、直观地了解宇宙的空间概况；空间尺度由大到小，让读者先从整体上对宇宙有所了解，再深入局部了解细节，这样顺序清楚，层次分明，符合观众的思维习惯；同时，由宇宙反观地球，就是人类的未来之路，这样的顺序和作者由广阔的宇宙，穿过无尽的空间，最终回到人类家园的探索和发现过程，与“人类的未来取决于我们对这个宇宙的了解程度”的认识相契合。（每点2分）

###### **任务二 了解表达技巧，品味语言特色**

3．科普文是解说、介绍科学知识的说明性文章，这篇科普文运用了哪些说明方法？试结合文本加以分析。（4分）

答：\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】①列数字，如“宇宙间有若干千亿（1011）个星系。每个星系平均由1000亿个恒星组成”。列数字可以使人们对事物的大小、数量有比较清晰的了解。②作比较，如“一束光每秒钟传播18.6万英里，约30万千米，也就是7倍于地球的周长”。作者把光每秒钟传播的距离和地球周长作比较，使我们对光的传播速度有了具体可感的认识。③举例子，如“例如，在那里有红色行星——火星”，举例说明“在气体行星及其冰冻卫星的内侧就是充满岩石的温暖的内太阳系”。④打比方，如“我们心情激动，感叹不已，如同回忆起许久以前的一次悬崖失足那样令人晕眩战栗”。这个比喻化抽象为具体，形象生动地写出了探索宇宙奥秘时的心情。（每点1分）

4．本文是科教片的解说词。文中大段的议论与抒情，是否干扰了对宇宙的说明？请说明理由。（4分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】没有干扰对宇宙的说明。本文作为科教片的解说词，不仅要让观众了解宇宙的客观构成等知识，还要表达人类对宇宙的主观认识和人类探索宇宙的意义，这样才能感染观众，激发他们对宇宙的兴趣。所以，大段的议论和抒情不仅没有干扰对宇宙的说明，反而使说明更具科学意蕴和人文内涵。（明确观点1分，说明理由3分）

5．作为科教片的解说词，本文融科学性与说明性于一体。请结合文本加以分析。（6分）

答：\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】①语言准确，逻辑性强，具有很强的科学性。如“我认为，宇宙里很可能到处都充满着生命，只是我们人类尚未发现而已。我们的探索才刚刚开始”，“可能”表述严谨，“只是”“而已”“才”“刚刚”用词准确，表明人类宇宙探索之长路漫漫，体现了科学性的特点。②通俗易懂，形象生动，让读者易于理解和接受，具有很强的说明性。文章善用比喻、拟人等手法使表述更加形象生动。如“其中有些是孤独的徘徊者，大部分则群集在一起，挤作一团，在大宇宙的黑夜里不停地飘荡”，运用比喻与拟人的手法，形象生动地让读者了解这些星系的存在状态。（每点3分）

**素养必备**

融科学性与说明性于一体

1.科学性。科学性是所有科学作品的生命，科普作品也不例外。科学必须揭示事物的客观规律，探求客观真理，这是我们认识世界和改造世界的指南。科普作品担负着向大众普及科学知识、启蒙思想的职责，更应保证科学性。失去科学性的科普作品也就失去了存在的价值。

2.说明性。科普作品的写作目的在于介绍科学知识，需要说明事物的形状、构造、类别、关系、功能等，解释事物的原理、特点等。为把事物特征说清楚，或把事理阐述明白，须运用相应的说明方法。

###### **思维发展与提升**

6．苏轼在《超然台记》中说“物非有大小也，自其内而观之，未有不高且大者也”。本文作者却在文中一方面说宇宙辽阔无垠，充满奥秘；另一方面又说人类渺小如“一粒尘埃”。请结合课文与相关资料，谈谈你的看法。（4分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】

（示例1）宇宙辽阔无垠，神秘莫测。浩瀚的宇宙是个未知数，等待人类去探索发现。而人类生存的地球只是宇宙中的沧海一粟，它的存在可能仅仅对我们有意义。地球只是浩瀚宇宙中的一个点，人类又只是地球上的一小点，人类在宇宙面前是极其渺小的。面对浩瀚的宇宙，一切都显得渺小。

（示例2）宇宙虽神秘，人力亦无穷。苏轼说得对，事物本无大小之别，如果从事物的内部来观察它，那么没有一物不是高大的。古人认为宇宙辽阔无垠，神秘莫测，是从地球的视角来看待宇宙，而今人早已涉足外太空，不断揭开宇宙的神秘面纱，了解宇宙运行规律。宇宙无涯，探索亦无止境。人类个体虽渺小，但可以不断探知宇宙奥妙，甚至可以走出我们“暂时居住”的地球。

#### **文本联读·拓思维**

《自然选择的证明》和《宇宙的边疆》这两篇文章分别属于学术论著和科普作品，在表达技巧、语言风格、写作目的上有所不同。请结合原文简要分析，完成表格。（6分）

|  |  |  |  |
| --- | --- | --- | --- |
| **篇目** | **表达技巧** | **语言风格** | **写作目的** |
| 《自然选择的证明》 | ① \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ | ② \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ | ③ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ |
| 《宇宙的边疆》 | ④ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ | ⑤ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ | ⑥ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ |

【答案】主要运用举例论证阐述观点。； 更具抽象性与概括性，强调逻辑论证，讲究理论的严密。； 对原创性科学理论的阐释，用于交流、学习、研究。； 运用了大量的议论与抒情。； 多深入浅出，注重一般性原理的阐释，讲究可读性。； 对科学知识的普及性介绍，用于传播、教育、推广。（每处1分）

##### **读写结合**

**一、课内积累**

**科学之光永远灿烂**

英国的达尔文通过对古生物学和地质学的精细研究提出了“进化论”，受到后人广泛的推崇。而他能取得这样的成就，正是因为他具有献身科学的精神和战胜疾病困扰的毅力。早在环球考察之前，达尔文就有心悸的症状，但是为了能参加环球考察，他隐瞒了自己的病情，那时他已决心拼上一切去参加这次航海。沿途他不辞劳苦，对各地生物的特性进行了细致的考察，搜集了大量的资料。《物种起源》这本书的每一句、每一页都是他在忍受了极大的肉体痛苦的情况下写出来的。他就这样苦干了几十年，留下了二十多部科学著作和上百篇论文。他用执着的信念和勇于探索的精神，捍卫了科学真理。

**运用角度**

执着 信念 勇于探索 捍卫科学真理

**素材运用**

在科学的浩瀚星空中，达尔文恰似一颗执着燃烧的恒星，以探索为轨，以真理为光，照亮了人类认知的暗夜。当“神创论”的阴霾遮蔽智慧的天空，他毅然踏上贝格尔舰，环球五载，在加拉帕戈斯群岛的嶙峋岩岸间，在热带雨林葳蕤的枝叶下，用放大镜捕捉着生物变异的蛛丝马迹。那些被斥为“异端”的化石证据，在他眼中却是时光镌刻的密码，每一道纹路都诉说着物种演化的史诗。《物种起源》的出版，宛如惊雷炸裂思想的冻土。面对铺天盖地的谩骂与质疑，达尔文没有选择沉默或妥协，而是用更翔实的证据、更缜密的逻辑，筑起捍卫真理的长城。他深知，科学真理如同深海珍珠，须经历沙砾磨砺之痛，方能绽放理性之光。这种勇于探索的胆识，这种为真理付出一切的精神，正是人类文明进步的永恒动力。

**二、课外拓展**

**寻找太阳系外生命**

刘浩源

很多科学家认为，除地球外，太阳系中任何一个星球存在生命的可能性都不大，而在太阳系外找到生命的可能性很大。一些科学家通过计算发现，宇宙中存在大量与地球类似的行星。英国天文学家帕特里克·摩尔爵士曾宣称，科学家将会在50年内找出证据，证明太阳系外确实存在外星生物。他认为，太阳系外必定存在外星生命，但以人类目前的航天科技发展水平，尚无法有效与外星生命主动取得联系。

太阳系内存在生命可能性不大

科学家认为太阳系中火星的卫星、木星的卫星木卫二和土星的卫星土卫六上可能存在某种形式的初级生命，但现在仍无所发现。如果考虑到生命存在所需要的基本条件，太阳系内存在生命的机会非常小。这是因为地球和其他星球存在大量多样生命形式的关键是有光合作用。光合作用能够吸收并转化光能，用转化后的能量完成生命所需的生化任务。如果生物曾经在一个星球有过繁盛时期，光合作用将改变这个星球外层的大气成分，就像生命对地球大气的发生改变一样。而除地球外，太阳系内其他星球的大气都没有发生类似改变。虽然生活在星球表面深层的初级生命可能通过化学反应而不是光合作用存活，而这种存活方式也不会影响星球的大气构成，但是科学家要寻找的，是像地球上这样的大规模的生命存在。它深刻地改变了其所在行星的地质化学构成，能够远距离观测到。

从物理学定律判定太阳系外存在生命

根据物理学定律，宇宙各处均相同，引力、电场和磁场、量子理论等物理规律是普适的，原子和分子的物理结构是一样的；那么我们的地球在宇宙中应该也不是唯一的。

银河系直径大约10万光年，其中分布着大约2000亿颗恒星。其中有行星环境的超过15%，那么在银河系中至少有数百亿颗行星。地球只不过是银河系数百亿同类环境之“一”而已，而宇宙中更是有千百亿个这样的世界。一位天文学家曾说：“银河系中的行星就像虫子一样普遍，如果银河系中的多数行星都像木星一般大，并且所有行星都无法孕育生命，那将是非常奇怪的事情，这太不合情理了。”

地球并非“得天独厚”

长久以来，科学家相信，我们这个小小的世界除了拥有岩石地层和宽广海洋，还具有其他一些特殊之处：比如有月球，这对稳定气候是不可或缺的；比如它在太阳系中的位置也是非常理想的；等等。大概正是将这万千恩宠集于一身，地球才能够成为生命的庇护所，同时这些限制条件也大大降低了在宇宙其他地方找到类似星球的可能性。然而近期科学家的研究表明，这些认为地球是宇宙中得天独厚的“特例”的观点也许是错误的。比如科学家研究证实，没有卫星的行星也完全适宜生命繁衍。最新计算表明，在过去10亿年间如果没有月亮，地球的自转轴只会发生很小的角度变化，这根本不可能妨碍生命的形成。那种认为月球稳定了地球运行的轨道，从而保障了它的温和气候的美丽说法是站不住脚的。

科学家曾担心在其他星系中，对于生命至关重要的水可能是极其稀少的。1994年，苏梅克-列维九号彗星撞击木星，出现了大量水蒸气。这说明，这颗彗星上带有大量的固体水。苏梅克-列维九号彗星在宇宙中是颗很平常的彗星，它在宇宙中穿行，产生生命的可能性是极大的。在其他恒星系就像在太阳系中一样，只要彗星或小行星撞上行星，就能为后者带来水资源。如果拥有液态水的宜居行星在宇宙中比比皆是的话，那么生命也应该是普遍存在的。这些证据都表明，与人们曾经认为的相反，我们这颗小小的地球并未受到什么特别眷顾。

太阳系外的生命可能不同于地球生命

太阳系外的生命与我们地球生命一样吗?宇宙生命可能不以人想象的形式存在，也可能根本不具有地球生命的生存方式。生物学定律是否放之宇宙而皆准？或许地球生命只是庞大的生命系统中某一个细小分支而已，还存在着数以百计的其他生命形式。

科学家认为，宇宙各处生命的物理极限是基本相同的。生命的定义应是：可以自我复制，有能够通过自然选择进化的机制，可能是碳基分子构成的。参照地球生命，宇宙中生命存在的温度范围应在零下50到零上150之间。

科学家认为，水是生命必不可少的条件。只要有液态或气态水，同时有甲烷、氨和紫外线，生命就可以产生。氧并不是所有生物呼吸所必需的，例如地球生物酵母菌的呼吸就不需要氧。植物也有无氧呼吸的，只是在无氧的状态下，植物的氧化基质不会被完全氧化而已。倘若地球真的无氧，也许地球生物可以进化为适宜无氧状态下的生命形式。

地球生物的界面有陆地（包括地下）、海洋、天空。那么，宇宙星球的生命界面可以在任何一个适宜的环境中，不一定在星球表面，也可能在星球内部，或在距离星球数百千米的大气层中。

在常人看来，适宜生命生存的大气压为760毫米高的汞柱，即一个标准大气压。然而，地球上的海洋生物承受的大气压可以是标准大气压的上百倍。高空中的大气压则又不同程度地低于标准大气压，但生命依然正常存在。那么，宇宙生命可能根据环境的需要，进化成适应更高或更低的大气压的生命。

（有删改）

**名师赏评**

本文是科普文，使用小标题从多个方面来展示材料、表达主题，使行文条理清楚。

文中使用了举例子、列数字、打比方等说明方法，例如“英国天文学家帕特里克·摩尔爵士曾宣称……”是举例子，增强了说服力；“银河系直径大约10万光年，其中分布着大约2000亿颗恒星”是列数字，使内容更准确、科学、具体；“银河系中的行星就像虫子一样普遍”是打比方，把“银河系中的行星”比喻为“虫子”。本文的语言准确严谨、形象生动、通俗易懂。

**三、读写结合**

英国天文学家帕特里克·摩尔爵士曾宣称，科学家将会在50年内找出证据，证明太阳系外确实存在外星生物。这体现了他坚守信念、勇于探索的科学精神。请写一个语段，体现你的认识和思考。要求：至少运用一种修辞手法，语言简明、连贯，不少于200个字。（10分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】（示例）坚守信念，勇于探索的科学精神，是科学进步的永恒动力。以“嫦娥六号”月背采样任务为例，科学家历经数年攻关，克服重重技术难题，终成功实施月背采样任务。这一壮举背后，是数万小时的实验数据支撑，是无数次的失败与重来。如同航海家穿越风暴追寻新大陆，科学家在未知领域探索时，也需直面种种不确定性。他们运用高精度仪器捕捉宇宙微波背景辐射，如同在浩瀚星海中寻找生命密码；通过大型重离子对撞装置模拟宇宙大爆炸瞬间，恰似在时间长河中回溯万物起源。这些探索活动，不仅拓展了人类认知边界，更彰显了科学精神的崇高与伟大。正如爱因斯坦所言：“想象力比知识更重要。”科学家正是以信念为帆，以探索为桨，在未知海域破浪前行。（中心明确3分，至少运用一种修辞手法3分，语言简明、连贯2分，符合字数要求2分）

## **第14课 \*天文学上的旷世之争**

**课时目标：**

1.了解“宣夜说”“盖天说”“浑天说”等学说的基本观点、历史贡献及其相互关系，理解“浑盖之争”的本质。

2.分析文章是怎样梳理、概括中国古代宇宙结构学说的发展过程的。

3.把握科学史文章的特点，更深刻地认识科学，理解科学。

#### **自主学习·悟新知**

**一、作者名片**



关增建（1956—），国际科学史研究院通讯院士。1990年毕业于中国科技大学，获科学史博士学位。同年入郑州大学工作，1995年任郑州大学文博学院院长。2000年调入上海交通大学，后任上海交通大学人文学院常务副院长等职。2019年当选国际科学史研究院通讯院士。主要从事科学技术史尤其是物理学史、计量史等领域的研究，发表论文百余篇，多次获奖。和丘光明一同被誉为“中国计量史界的双璧”。

代表作品：《中国古代物理思想探索》《计量史话》《中国近现代计量史稿》等。

**二、写作背景**

现代文明的高速发展，使得自然科学与人文科学之间的距离越来越遥远。20世纪初，哈佛大学校长建议用“科学与学术”的提法来兼顾两者。萨顿大声疾呼，要在人文学者和自然科学家之间建立一座桥梁。21世纪初，上海交通大学科学史系的几位专家学者共同撰写了《科学史十五讲》，以若干具有划时代意义的里程碑连线，贯串整个人类科学史，择要叙论重要人物、事件及其社会功能、文化性质并时加点评。本文选自《科学史十五讲》第三讲“中国古代的科学技术”。

**三、知识链接**

**“地心说”与“日心说”**

“地心说”起源很早，最初由米利都学派形成初步理念，后由古希腊学者欧多克斯提出，经亚里士多德完善，又经托勒密进一步发展而成。该学说认为宇宙是一个有限的球体，分为天地两层，地球位于宇宙中心，所以日月围绕地球运行，物体总是落向地面。

“日心说”由哥白尼提出，该学说认为地球是球形的；地球在运动，并且24小时自转一周；太阳是不动的，地球以及其他行星都以太阳为中心进行圆周运动，只有月亮环绕地球运行。

**四、语言基础**

1．**读准字音**

① 安谧（ ）

② 圭臬（ ）（ ）

③ 相形见绌（ ）

④ 炎炽（ ）

⑤ 晷影（ ）

⑥ 周髀（ ）

【答案】① mì

② ɡuī；niè

③ chù

④ chì

⑤ ɡuǐ

⑥ bì

2．**写对字形**

①

②

【答案】① 帷；维；椎；锥；推

② 绽；淀；锭；靛

3．**辨析词义**

贯串·贯穿

**辨析** “贯串”一般只指“从头到尾穿过一个或一系列事物”，用于较抽象的事物。“贯穿”除了指“从头到尾穿过一个或一系列事物”，还指“穿过、连通”，可用于抽象的事物，也可用于具体的事物。

**应用** 这条铁路\_ \_ \_ \_ 该省南北，在经济发展过程中发挥了重要作用。

【答案】贯穿

4．**积累成语**

请根据词义，在横线上填写恰当的课内成语。

① \_ \_ \_ \_ \_ \_ \_ \_ ：比喻话说得简短而能切中要害。

② \_ \_ \_ \_ \_ \_ \_ \_ ：形容诗文、表演等有感染力，使人心情激动。

③ \_ \_ \_ \_ \_ \_ \_ \_ ：比喻基础稳固，不容易动摇。

④ \_ \_ \_ \_ \_ \_ \_ \_ ：跟另一人或事物比较起来显得远远不如。

⑤ \_ \_ \_ \_ \_ \_ \_ \_ ：形容名声极大。

⑥ \_ \_ \_ \_ \_ \_ \_ \_ ：比喻文章像波涛一样壮阔起伏，也比喻思潮的起伏变化。

【答案】① 一针见血

② 扣人心弦

③ 根深蒂固

④ 相形见绌

⑤ 赫赫有名

⑥ 波澜起伏

5．**正确使用俗语**

将下列俗语填入文中横线上，恰当的一项是（ ）

农历是我国的传统历法，相传创始于夏代，故又叫夏历。它是阴阳合历，平年12个月，闰年13个月，19年7闰。古人又把一个太阳年分为24个节气，便于农事。古人还用十天干和十二地支搭配纪年，60年为一甲子，周而复始。“  ”是说干支不能搞错，形容办事认真，丝毫不含糊。我国古代天文学家为了制订历法，指导农事，经常观察日月星辰。

A. 丁是丁，卯是卯 B. 一口唾沫一个钉

C. 一是一，二是二 D. 桥归桥，路归路

【答案】A

【解析】A项，丁是丁，卯是卯：形容对事认真，一丝不苟，毫不含糊。B项，一口唾沫一个钉：比喻守信用，说话算数，也形容人霸道，说出话来别人必须照办。C项，一是一，二是二：形容说话做事老老实实，是一不二。D项，桥归桥，路归路：比喻二者互不相干，也比喻事情明明白白地摆在那里。根据“干支不能搞错，形容办事认真，丝毫不含糊”可知，应填“丁是丁，卯是卯”。

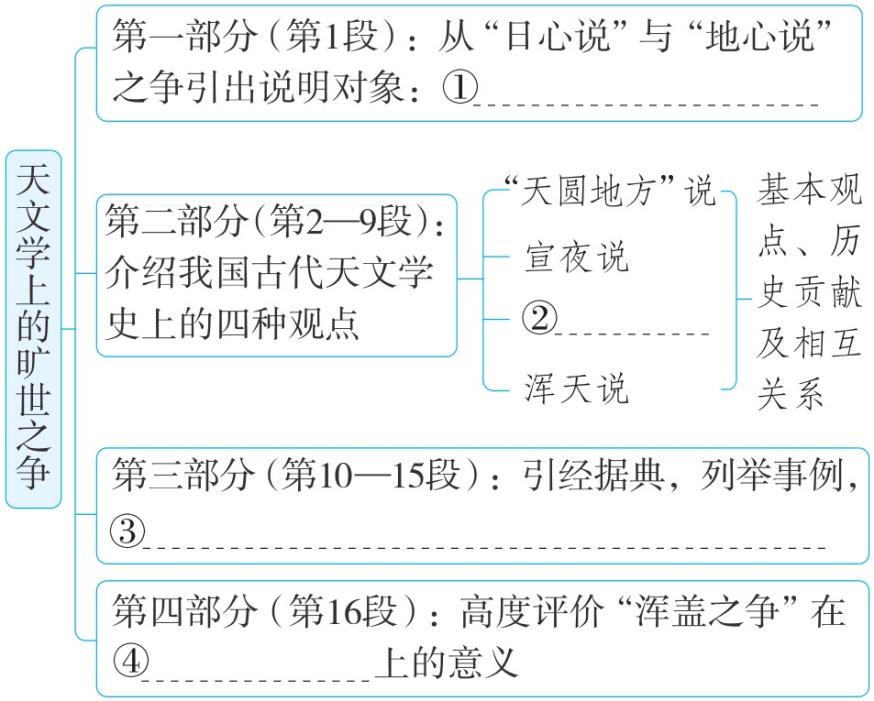
**语用知识**

正确使用俗语

“俗语”是通俗并广泛流行的定型的语句，简练而形象化，大多数是劳动人民创造出来的，反映人民的生活经验和愿望。也叫俗话。如，业内一位专家指出：把治污仅仅当成一种花钱的赔本买卖，而不是当成市场经济中的产业，只能是按倒葫芦瓢起来（“按倒葫芦瓢起来”比喻问题一个接一个，刚解决一个，另一个又冒了出来，使人应接不暇）。

**五、文意梳理**

1．**厘清结构**



【答案】“浑盖之争”； 盖天说； 详尽介绍“浑盖之争”； 中国天文学史

2．**概括主旨**

本文回顾了我国古代关于①\_ \_ \_ \_ \_ \_ \_ \_ 的认识的争论，介绍了几种主要学说，以中国古代天文学上的一场持续千余年之久的学术争论为话题，分析了这场争论的影响、意义、特点及其所体现的②\_ \_ \_ \_ \_ \_ \_ \_ ，表达了对③\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ 的赞美之情，普及了中国古代天文学方面的知识。

【答案】宇宙结构； 科学原则； 古人的智慧和探究精神

#### **合作探究·提能力**

**情境探究**

在科学史上，天文学的发展，历来波澜起伏，曲折复杂，扣人心弦。在西方，人们熟知的是哥白尼“日心说”与托勒密“地心说”旷日持久的争论，正是这场争论，推动了天文学的发展以及天文学领域哥白尼革命的发生，最终促成了近代科学的建立。那么，在东方的中国，在对宇宙结构的认识上，又存在什么样的争论呢? 为丰富同学们的认知，学校拟在科技馆举行“东方宇宙结构认知展”，请根据课文内容，完成任务。

###### **任务一 理解概念，梳理脉络**

1．请你为“东方宇宙结构认知展”制作展板，以表格形式介绍中国古代天文学史上有关宇宙结构的各个学说的代表人物、基本观点、历史贡献。（6分）

|  |  |  |  |
| --- | --- | --- | --- |
| **学说** | **代表人物** | **基本观点** | **历史贡献** |
| “天圆地方”说 | 孔子、曾子 | 天是圆形平盖，在人的头顶上方悬置，地是方的，静止不动 | ① \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ |
| ② \_ \_ \_ \_ \_ \_ | 郗萌（记载者） | ③ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ | 似乎更接近宇宙的实际情形 |
| 盖天说 | ④ \_ \_ \_ \_ \_ \_ | ⑤ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ | 能够解释人们日常生活中见到的各种天象；能够预测日月星辰的运行；能够编制历法，满足社会需求 |
| 浑天说 | 落下闳、邓平、扬雄、葛洪、朱熹、祖暅等 | 天在外，地在内，天大地小 | ⑥ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ |

【答案】形成了早期人们对宇宙形状的认识； 宣夜说； 日月星辰自由飘浮在虚空中，它们之间相互独立，没有联系； 司马迁； 天地是两个中央凸起的平行平面，天在上，地在下，天地相距8万里，日月星辰围绕着北极依附在天壳上运动； 更加符合观测依据；制订了更符合实际天象的历法；成为对宇宙结构认识的主流（每处1分）

2．展板中关于中国古代四种宇宙结构学说的安排顺序与课文中的顺序是一致的。这是一种什么顺序？请简要分析，并说说这样安排有什么好处。（6分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】（1）时间顺序。（1分）本文首先提出我国历史上的“浑盖之争”，总领全文；然后按照时间顺序分别介绍了“天圆地方”说、宣夜说、盖天说、浑天说四种学说；接着解说盖天说和浑天说之间的争论；最后对这场争论进行评析，分析了这场争论的影响、特点、秉持的原则等。（3分）（2）这样安排既使说明的层次清晰，又体现了中国古代对宇宙结构的认识过程。（2分）

**素养必备**

合理安排说明的顺序

写说明文，为了使文章内容条理化,有一定的次序,让读者读起来思路清晰、明了，要按一定的顺序安排材料。说明顺序主要有：

1.时间顺序：按照事理发展过程的先后来介绍某一事物，即以时间的先后介绍事物的发生、发展。

2.空间顺序：按被说明对象的空间存在形式，或自上而下，或由前而后，或从外到内，或由一中心点向四面扩散进行说明的顺序。

3.逻辑顺序：按照事物内部的联系或人们认识事物的过程、规律进行说明的顺序。

一篇说明文可以根据说明目的和对象，以一种说明顺序为主，兼用其他说明顺序，但一定要分清主要使用的是哪种说明顺序。

###### **任务二 分析观点，鉴赏方法**

3．展览拟邀请你为大家解说“浑盖之争”，请搜集材料并结合课文内容分析，“浑盖之争”具有怎样的特点？“浑盖之争”的本质是什么？（6分）

答：

【答案】

（1）特点：“浑盖之争”在中国天文学史上持续时间长、参与人员多、涉及面广、讨论内容丰富、后续影响大。（3分）

（2）本质：“浑盖之争”是围绕宇宙结构问题展开的，涉及宇宙结构的方方面面，其本质是有关宇宙结构问题的学术之争和科学思想之争。（3分）

4．本文在说明“浑盖之争”时，主要采用了什么方法？有什么好处？请简要分析。（4分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】①比较说明：如第8段，将两种学说的主要观点放在一起进行比较，使争论的话题一目了然。②引用说明：为了说明双方观点的不同，作者直接或间接引用了扬雄、王充、葛洪等人的话，使说理更加充分真实。（每点2分）

5．作为一篇科学史文章,本文有哪些特点？请结合文章内容简要分析。（6分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】①启迪深刻,发人深省。本文通过分析中国天文学上的旷世之争,揭示了这场旷世之争秉持的一个重要原则:判断一个学说是否正确，关键在于其是否符合实际情况，而不是是否遵循某种先验的哲学理念。这是中国古代天文学的一个优秀传统,给读者以深刻的启迪。②观点公允,说服力强。文中的观点表述客观公允,运用引用等多种方法使观点真实清楚,具有较强的说服力。③思维严密,语言准确。文章使用文言文与白话文互为注解,简洁而有深刻含意,平实中蕴藏着哲理。④引例充实,阐释明晰。文中引用了大量的材料,使文章具有很强的说服力和历史感;在阐述材料时做到简洁明晰，让读者易于接受。（每点2分，答出三点即可）

###### **任务三 拓展认知，写作交流**

6．参观完“东方宇宙结构认知展”，你获得了哪些启示？请你在“宇宙的未来”留言簿上写下自己的思考和感悟。200个字左右。（6分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】（示例）站在宇宙未来的十字路口，我好奇暗物质是否编织着时空经纬，量子纠缠能否架起星际对话的桥梁。回望苍穹探索史，从“天圆地方”说到浑盖之争，从托勒密到爱因斯坦，人类以渺小之躯丈量浩瀚，恰似萤火窥探星河。这启示我们：宇宙奥秘如未开封的古籍，我们既要传承古人“仰观天文”的求索精神，更要以开放胸襟拥抱新的发现。或许在未来某天，人类终能读懂宇宙这本“无字天书”，那份对未知的敬畏与好奇，将永远指引我们前行。（内容紧扣主题2分，观点明确且有深度2分，语言表达流畅、生动1分，字数符合要求1分）

#### **文本联读·拓思维**

本单元的三篇文章皆为自然科学论著，通过学习，你对科学精神一定有了新的认识和理解。请你根据自己的思考，谈谈这三篇文章所蕴含的科学精神。（6分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】①《自然选择的证明》体现了实事求是的科学精神。达尔文没有迷信当时流行的权威思想，也没有靠主观臆断提出自己的观点，而是在实地考察得来的丰富资料的基础上提出进化论。②《宇宙的边疆》体现了不断探索的科学精神。宇宙是浩瀚无垠的，人类的好奇心是无穷的，人类对未知的探索也是无止境的。探索宇宙能让人类进一步了解自己生存的家园，思考人类的未来。③《天文学上的旷世之争》体现了注重实践的科学精神。在浑天说与盖天说千余年的争论中，表现出的是重视实际校验的科学精神。也就是判断一个学说是否正确，不是看它是否遵循某种先验的哲学观念，而是看它是否符合实际情况。（每点2分）

##### **读写结合**

**一、课内积累**

**科学求实精神**

《天文学上的旷世之争》展现了中国古代天文学领域浑天说与盖天说的激烈争论。在争论中，双方秉持着尊重客观事实、从实际出发的原则。祖暅比较浑盖双方的差异，查阅典籍记载，通过实地天文观测，并使用仪器校验，发现浑天说更符合实际后，才得出浑天说可信的结论。浑盖之争秉持着一个原则：判断学说正确与否，关键在于其是否符合实际情况，而不是是否遵循先验的哲学观念。这种科学求实精神，是坚持追求真理、勇于探索科学规律的执着信念，是坚持一切从实际出发、理论联系实际的观点方法，也是不盲从、不迷信、只唯实的思想作风。

**运用角度**

科学求实精神 执着追求 探求真理 实事求是

**素材运用**

科学求实精神，如磐石般矗立于人类文明长河。回望历史，“浑盖之争”便是这一精神的生动注脚。浑盖之争，不仅是宇宙观的碰撞，更是求实精神的较量。东汉张衡以“浑天仪”观测天象，其“浑天如鸡子”的比喻，将抽象理论具象化，让真理在观测中显现。这正如伽利略举起望远镜，让木星卫星的光芒穿透“地心说”的迷雾；亦如达尔文实地考察，在对鸟的观察中窥见进化的密码。科学求实，并非盲目追随权威，而是如匠人般雕琢每个细节，如侦探般侦破每个疑点。正是这种精神，铸就了人类认知的阶梯，让文明在求实中步步登高。

**二、课外拓展**

**古代中国的天文学**

我国的天文学萌芽较早，早在公元前24世纪的尧舜时代，就设立了专职的天文官，专门从事“观象授时”。早在仰韶文化时期，人们就描绘了光芒四射的太阳形象，对太阳上的变化也屡有记载，描绘出太阳边缘有大小如同弹丸、呈倾斜状态的太阳黑子。这是我国天文学的早期萌芽。

我国古代天文学研究的一个重要成果就是历法的制订。早在夏代我国就已有了历法，商代有了阴阳合历，创立了干支纪日法。春秋时期已经开始采用19年闰7个月的方法。最迟在公元前7世纪，我国已采用以土圭观测日影的方法来测定冬至和夏至。公元前4世纪的战国时期已经使用四分历。可能在战国末期，产生了关于二十四节气的见解。我国很早就开始了天文观测，并且有了关于日食、月食、彗星、流星等世界上最早的观测记录。大约在公元前360年至公元前350年间，楚国人甘德写了《天文星占》，魏国人石申写了《天文》。这是世界上最早的星表。

自然哲学作为古代科学的一种形态，在春秋战国时期取得了光辉的成果。以墨家、道家以及荀子和韩非为代表的朴素唯物主义哲学对科学的发展有较大的影响。探讨世界万物的本原也是中国古代自然哲学的重要内容。在殷周时期就有了阴阳八卦学说和五行说。《易经》中用八卦代表自然界中最常见的八种东西，认为阳和阴两种势力交感推移，生成其他六种东西，并使万物发展变化。五行说在夏代就有萌芽，它把宇宙万物归结为水、火、木、金、土五种元素。战国时期的阴阳家邹衍则用阴阳来统率五行，试图用阴阳五行对自然界和社会进行统一的解释。《管子·水地》篇中说“水者何也？万物之本原也”，把水看成万物之本原；道家的创始人老子则在春秋末年提出“道”是“万物之宗”的思想。宋尹学派则提出了唯物主义的精气说，认为“气”是一种微小的看不见、摸不着的物质实体，“精”是比“气”更细小的东西，“精”“气”乃世界的本原，谷物、星辰都是由精气产生的，就是精神现象也是由气的流动而产生的。战国末期的荀子则进一步发挥了物质性的精气学说，认为世间万物都是由统一的物质性的气构成的，水、火、生物等都是气的发展的不同阶段。荀子还要求“明天人之分”，弄清其间的关系，并提出“制天命而用之”的光辉命题。

中国的自然哲学家们也曾涉及物质有没有最小单位或物质能不能无限分割等问题。惠施提出“至小无内，谓之小一”，即物质的最小单位无内可言。也有人主张物质可以无限分割，提出了“一尺之棰，日取其半，万世不竭”的命题。关于宇宙结构的学说是中国古代自然哲学的重要内容。先秦早期就有了“天圆地方”说，主张“天圆如张盖，地方如棋局”。到了西周时期，盖天说出现，认为天如斗笠，大地像一个倒扣着的盘子。盖天说不符合天体的真相，不能解释天体运转的现象。比盖天说进步些的是地圆说。战国时期赵国人慎到主张“天体如弹丸”。《庄子》则进一步对地不动的观念提出疑问。尸子（即尸佼，商鞅的老师）则有了对地球自转运动的描述。战国末期，李斯猜测地在空间中位移，有了“日行一度”的观念。到西汉末年更有了地在空间中的位移的科学描述。同时对地动而人觉察不到的原因进行了解释：“地恒动不止人不知，譬如人在大舟中，闭牖而坐，舟行不觉也。”（《尚书纬·考灵曜》）这确实是我国古代人民认识宇宙史上的一个伟大创见。战国时期学术繁荣的另一个重要成果是实验方法的萌芽。《墨经》在中国古代科学史上是一部非常重要的著作。《墨经》中关于光学的实验方法和近代科学实验方法相似。墨子和他的学生进行了关于光的直线传播的小孔成像实验，以及平面镜、凹镜、凸镜的实验，说明了焦距和物体成像的关系。《墨经》中还用实验方法讨论了衡器一类的杠杆平衡情况，墨家比阿基米德更早注意到距离和平衡的关系，只是还没有明确定量地研究它。墨家也很注意概念研究和逻辑推理，对于一切事物先提出名词，再下定义，最后进行解释。这些对后来逻辑学的发展都起到了推动作用。春秋战国时期百家争鸣的学术思想是一个内涵丰富的宝藏，应当深入挖掘。

天文学在秦汉时期有了新的发展。东汉著名天文学家张衡对浑天说的宇宙结构理论进行了说明：“浑天如鸡子，天体如弹丸，地如鸡中黄，孤居于内，天大而地小，天表里有水，天之包地，犹壳之裹黄。天地各乘气而立，载水而浮。”浑天说认识到大地是一个悬浮于宇宙空间的圆球。张衡曾两度担任汉朝掌管天文的太史令，精通天文历算，创制了世界上最早利用水利转动的浑象和测定地震的地动仪（候风地动仪），正确地解释了月食的成因，说明月光是日光的反照，月食是由于月球进入地影而产生的。张衡因此成为我国天文学史上的杰出人物。汉代以后，我国天文学主要向实用方面发展，在天象观测、仪器制造和历法上作出了许多贡献。中国的实用天文学历来受到官方的重视，这一点和西方不尽相同。汉代已有了关于太阳黑子、新星、超新星的明确记录，对日食、彗星、北极光均有细致形象的描述，天文观测已成为一个传统，历代相继。在历法方面，汉武帝招募天下历法专家20余人，制订《太初历》。东晋的虞喜发现了岁差现象，即冬至点的每年西移现象。虞喜根据历史记录进行推算，提出了每50年向西移动一度的岁差值。到南北朝时，祖冲之又把它引入了历法之中，并在继承前人成就和自己实测的基础上制订了《大明历》。在这些历法中，许多天文常数的测定都已达到了较高的水平。这些成就为中国天文学的发展奠定了坚实基础，也逐渐形成了中国独特的天文学体系。这个体系有独特的星群划分——三垣二十八宿，有独特的坐标系统——赤道坐标和365度，有独特的历法——带有二十四节气的阴阳合历，有独特的仪器——浑仪和浑象，有独特的宇宙结构体系——浑天说。中国的天文学与其他文明古国的天文学并立于世界文化之林。

后来，我国在天文学上又取得了一些成就，但总的来说，秦汉至南北朝时期是高峰期。我国古代的天文学研究成果一直居于世界前列，一些观测结果令人惊叹。我国公元前240年就有关于彗星的记载，它被认为是世界上最早的哈雷彗星记录。从那时起到1986年，哈雷彗星共回归30次，我国都有记录。1973年，我国考古工作者在湖南长沙马王堆的一座汉朝古墓内发现了一幅精致的彗星图，图上除彗星之外，还绘有云、气、月掩星和恒星。天文史学家对这幅图进行考释研究后，称之为《天文气象杂占》，认为这是迄今发现的世界上最古老的彗星图。早在两千多年前的先秦时期，我们的祖先就已经对各种形态的彗星进行了认真的观测，不仅画出了三尾彗、四尾彗，还似乎窥视到今天用大望远镜也很难见到的彗核。这足以说明中国古代的天象观测是何等精细入微。

（摘编自《科学史与方法论》）

**名师赏评**

本文是一篇科普文，以时间为顺序，运用引用、作比较等说明方法，清晰地介绍了中国古代天文学的发展状况，使读者对中国古代天文学有了清晰的认识。难能可贵的是，本文着意突出了中国古代天文学研究之早、取得的成果之丰、实际应用之广，字里行间满溢自豪感，使人不禁产生对中华文明的崇敬和热爱之情。

**三、读写结合**

我们经常要借助科学实验，来认识自然现象、自然性质、自然规律，请你介绍一个自己熟悉的科学实验。要求：选择合适的说明顺序进行说明，语言简明，条理清楚，200个字左右。（10分）

答： \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_

【答案】（示例）上午10点以后，先把盛有清水的脸盆放在阳光下。再往脸盆里斜着放一面镜子，并在距离脸盆不远的空地上竖着放一张白纸。然后，调整镜子的角度，让阳光照射在水下的镜子上，再利用水下的镜子把太阳光反射到白纸上。这样，你就有可能在白纸上观察到七色的光。这是因为太阳光沿着一定角度射入空气中，空气中的水对光进行了折射和反射，把光分解成了七种颜色，这是一种典型的色散现象。夏日雨后彩虹的出现就是一种光的色散现象。（说明顺序合理3分，语言简明3分，条理清楚2分，符合字数要求2分）