In this next module, we're going to talk about writing the method section.,The methods in material,section should give a clear overview of what was done.,It is the recipe for the study.,It gives sufficient information so that someone else could replicate the study.,You want to be complete in your materials and method section.,You want to give enough information that somebody can replicate your study, but try to minimize the complexity.,Try to make life as easy as possible for your reader.,So there's a couple of things you can do to make life easy for your reader.,You can do things like break your methods into smaller sections with subheadings, or cite a reference for commonly used methods.,Rather than going into all the details of a well known method, and wherever possible, display methods information in a flow diagram or even a table get creative.,There are a lot of things in the methods of material section that are better presented as a table or a flow diagram rather than as text.,Finally, in the method section, we're going to jump ship on some of the things that I've told you before.,The materials in method section is the one place where you may opt to use the passive voice, and where you may use jargon more liberally.,At the start of this unit, I mentioned a series of articles that are about, the different parts of a scientific manuscript that was written by Thomas Annsley and in the journal Clinical Chemistry.,This series is freely available online, and it's not just for chemists.,And I've pulled a few key figures from his articles that I really like.,This is a busy slide, and I'm not going to go over it in detail, but I'll leave it for you to peruse, because I really like how he's framed the method section.,He thinks of it as the who, what, when, where, how and why of your paper.,And he goes into details for each of those who maintained the records.,What was used, when was it done?,Where were the records kept? This is a nice checklist to go through as you're writing your method section. What do you need in your materials and method section?,You need to give information about the materials, things like drugs, buffers, chemicals, gases, re agents, sell lines.,You need to give specifics like ph temperature, ingredients, doses, all of those things.,It's a recipe, so they need the exact specifics so they can recreate it.,If your research involves human or animal subjects, you'll need to state that the research was approved by the appropriate ethics committee at your institution.,You actually need an official statement of that in your method section.,You also need to give details about the experimental protocol.,You need to say also, how you measured your variables.,How did you measure your dependent and independent variables?,What instruments did you use? Telescopes, microscopes, weighing scales, questionnaires, etc.,And then finally, what analyses did you do?,How did you analyze your data?,At the end of the day, the exact components of materials and methods will, of course, differ depending on your discipline.,So I'm just giving a broad overview here, but these are the basic elements that you might see.,As I've said before, I want to encourage you to make life easy for your reader.,The method section is not the most fun section to read.,It's likely that your reader is just going to skim the method section to look for the key things that they want to know.,So one way to help your reader navigate the methods is to break your method section into subsections with informative sub headings.,I'm just going to give you some examples of this.,So this was from a paper on viruses.,So they subsections were they had general approach, bio safety isolation of the virus, serilogic analysis, pathological and immuno histochemical studies and molecular analyses.,The reader then can easily find whatever they need to, because they can s just go to one of those subsections.,Here's another example. This one was looking at flying albatrosses.,So they have subjects in experimental protocols.,The subjects here are the flying albatrosses. Then hardware. And then they were using GPS tracking, so they had to say how they were processing the GPS data.,And then wind was a very important variable here, because we were talking about flying.,One more set of subheadings, just as an example, this one had cell culture and transactions, antibodies, plasmas, recomminant virus production and infection and so on and so forth.,You get the idea. Whatever your topic, breaking the methods into subsections is a good way to go.,Another way to make life easy for your reader is for commonly used methods, or or methods you've already described in a previous paper.,You could refer the reader to those references rather than going into all the details.,This works especially well if you can assume that most of your readership is already familiar with them method.,It may help the reader to not have to weed through a large number of experimental details that are already well documented elsewhere.,And what would this look like in the paper?,Well, when you get to the method that's already well known, you can just say, as previously described, and give readers the reference, and I'm giving you two examples here.,It helps with concession. Another way to make life easy for your readers is to use flow diagrams or tables to help simplify the explanation of methods.,One common flow chart that you see in clinical studies is a participant flow chart, which shows how participants flowed through your study.,Here, 174 persons were asked to participate.,103 enrolled in, 97 completed all the labs.,You can see that it's incredibly easy to glean information from a diagram like this.,Imagine if this same information was presented in text.,It would be hard to weed through and make sense of, and it would also be really boring to read.,A picture is much more efficient for imparting this kind of information.,Now, you'll commently see a participant flow diagrams like this in papers, but there are probably many other instances where we ought to make more use of diagrams. If you have studies with complex experimental protocols, complex docing of drugs, this information might be better in a diagram or a table.,So be creative and look for instances where you can represent experimental details visually.,The verb tense for the method section is exactly the same as in the result section.,You're going to report methods that are already completed in the past.,Tense because they are already done, done So we measured, we enrolled, we analyzed, and so on.,But you're going to use the present tense to describe how the data are presented in the paper, because when the reader reads the paper, the data are still presented in that way.,So would you say, you would say the data are summarized as Notice the passive voice there.,That's in the present tense, because the data are still summarized that way when the reader is reading the paper.,All right, so I've been admonishing you about the use of passive verbs,, but now I'm going to tell you that for the method section, it's actually OK to use the passive voice, or even a combination of passive inactive.,It's fine to go back and forth between passive and active, as long as it's not too jarring on the reader.,There's a couple of reasons why I'm okay with the passive voice in the method section.,One is that in the passive voice, it emphasized the what was measured, the what was done, rather than who did it.,And arguably, what was done is more important than who did it.,E.g. oral temperatures were measured. That's in the passive voice, that emphasizes the oral temperatures, as opposed to the researcher who is taking the temperatures.,The active voice here would be we measured oral temperatures, and that's OK, it's more lively, I think.,But again, it fails to emphasize the material method or variable of interest.,And one could argue that you want to emphasize that material or method in the method section.,Uh. The other reason that I think it's okay to use the passive voice here is that most people don't read the method section word for word, so it's okay. I think if the method section is a little boring, you can expect that your reader is just gonna skim the method section for the key things that they want more information on.,Um, also in the active voice, uh, the method section pay end up with most sentences starting with we ,If you try to put it in the active voice, you're going to have a lot of We measured, we observe, we analyzed.,That's fine to have a lot of sentences starting with WE, but it's also a little boring.,And if you're very creative, you can find ways to avoid starting every sentence with we, but I'm not sure it's worth that effort.,So just to give you an example of a method section with lots of passive voice and jargon, ,we have the peptides were synthesized by the Biopolymer core facility, and then we get a lot of jargon.,Here. We get, uh, we get another passive voice work.,Couple two. And then keyhole limpet Hemo sienin which, I don't know what that is, but the jargon is okay here.,We need the jargon here. And again, it's okay, I think, to put this in the passive voice.,Just to show you an example where the active voice was used in the method section, you can use the active voice in the method section.,Here's a fun example that relies mostly on the active voice.,For this unit, I'm going to pull a few examples from the British Medical Journal, the BMJ Christmas issue.,And if you're not familiar with the BMJ Christmas issue, it publishes humorous research.,So they makes for some fun examples.,And this is from a paper on academic spam.,Just to give you a little background.,I, like many,scientists, get multiple emails a day requesting that I submit a paper to some journal or attend some conference, ,and most of these are completely unrelated to what I do, and are basically spam and I just delete these.,But in the 2016,BMJ Christmas issue, for fun, some researchers actually studied this phenomenon more systematically, and here's a paragraph from their result section.,They write, we assessed the number of spam emails received in each collection phase. Detail analysis was undertaken of spam received in April 2014, june 2014.,In April 2015, the investigators raided their spam in invitations as being of no low, medium or high relevance to their academic careers.,We determined the number of duplicate spam invitations when possible.,We recorded the publisher for journal invitations and organizing body for conference invitations.,Finally, we conducted a qualitative analysis focusing on memorable spam.,And I think this works just fine.,It's mostly in the active voice.,Notice that the 2nd sentence does switch to the passive voice.,So again, it's okay to switch if it's not too jarring on your reader.,And you'll notice that they also did end up using we an awful lot as the subject of the sentence, but I think it reads well and it's easy to understand.,And it's okay that they have a number of sentences starting with we So there are certainly many ways to put the methods in the active voice and in the choices, really up to you.,And I'm just going to end here with a little bit more detail on academic spam, because I'm going to use this study on academic spm as an example in some of the upcoming modules.,Again, it's from the BMJ Christmas issue, so it's meant to be humorous,, but it's a short paper that accurately follows this standard format of a scientific manuscript, and it's fun, so it makes a great example.,So just for you to understand the context, every time I bring this study up, I went into my email box today and pulled out two academic spm emails that I received yesterday.,I'm showing you those here so you'll know what I'm talking about when I refer to this academic SPM study.,The 1st one on the left here was sent with high importance, and it says, greetings for the day.,Hope you are doing well. Two exclamation points after Greetings for the day.,With support of editorial board members in organizing committee, we would like welcome you.,You can see that it's grammatically incorrect on that one.,We wish if you could join as a keytote speaker in this grand event. The one on the right, very similar.,It says, this 2017, may you output the best papers of your career and get the best number of citations.,We sincerely hope this to be true and many more good things happen to you in this year.,And you can see that these are very funny and clearly spam.

在下一个模块中，我们将讨论如何编写“方法”部分。方法和材料部分应清楚地概述所做的工作。这是研究的秘诀。它提供了足够的信息，以便其他人可以复制该研究。您希望在“材料和方法”部分中填写完整内容。你想提供足够的信息，让别人可以复制你的研究，但要尽量减少复杂性。尽量让读者的生活尽可能轻松。因此，你可以做几件事来让读者的生活变得轻松。你可以做一些事情，比如用副标题将你的方法分成较小的部分，或者引用常用方法的参考文献，而不是详细介绍一个众所周知的方法的所有细节。并尽可能在流程图甚至表格中显示方法信息。发挥创意！方法和材料部分中有很多内容最好以表格或流程图的形式呈现，而不是以文本的形式呈现。最后，在方法部分，我们将讨论我之前告诉过你的一些事情。材料和方法部分是你可以选择使用被动语态的地方，也是你可以更自由地使用行话的地方。在本单元的开头，我提到了一系列关于科学手稿不同部分的文章。这是托马斯·安斯利在《临床化学》杂志上写的。该系列可在网上免费获得，而且不仅仅是为化学家准备的。我从他的文章中提取了一些我非常喜欢的关键人物。这是一张繁忙的幻灯片，我不打算详细介绍，但我会留给你仔细阅读，因为我真的很喜欢他构思方法部分的方式。他认为这是你的论文中的谁、什么、何时、何地、如何以及为什么。他详细介绍了其中的每一个细节。谁保存了记录？用了什么？什么时候完成的？记录保存在哪里？这是一份不错的清单。在你写方法部分的时候。你在“材料和方法”栏目中需要什么？你需要提供有关材料的信息，比如药物、缓冲液、化学品、气体、试剂、出售葡萄酒。你需要提供pH值、温度、成分、剂量等细节。这是一个食谱，所以他们需要确切的细节，这样他们才能重新创作。如果您的研究涉及人类或动物受试者，则需要声明该研究已获得所在机构的相应伦理委员会的批准。实际上，您需要在方法部分中对此进行正式声明。您还需要提供有关实验协议的详细信息。你还需要说出你是如何测量变量的。你是如何测量因变量和自变量的？你用了什么乐器？望远镜、显微镜、体重秤、问卷等。最后，你做了什么分析？归根结底，你是如何分析数据的？当然，材料和方法的确切组成部分会因您的学科而异。所以我只想在这里给大家一个大致的概述。但这些是你可能会看到的基本元素。正如我之前所说，我想鼓励你让读者的生活变得轻松。方法部分并不是读起来最有趣的部分，你的读者很可能会浏览方法部分，寻找他们想知道的关键内容。因此，帮助读者浏览方法的一种方法是将方法部分分解为形成性副标题中的小节部分。我们只想举一些例子，所以这来自一篇论文和病毒，所以他们的小节里有一般的方法，生物安全，病毒的分离血清学分析，病理和免疫组织化学研究以及分子分析。然后，读者可以轻松找到他们需要的任何内容，因为他们只需转到其中一个小节。这是另一个例子。这只是在看飞行的信天翁。因此，他们有受试者和实验方案。这里的拍摄对象是飞行的信天翁。然后是硬件，然后他们使用GPS跟踪。因此，他们必须说出他们是如何处理GPS数据的。然后，风是一个非常重要的变量，因为我们谈论的是飞行。再来一组副标题，举个例子。这个有细胞培养和转染、抗体、质粒、重组病毒的产生和感染等等。但是你明白了。无论你的主题是什么，将方法分成小节都是不错的选择。让读者生活更轻松的另一种方法是使用你在上一篇论文中已经描述过的常用方法或方法。你可以向读者推荐这些参考文献，而不必详细介绍所有细节。如果你能假设你的大多数读者已经熟悉这种方法，那么这个方法就特别有效。读者不必通读其他地方已经有据可查的大量实验细节，这可能会对读者有所帮助。这在报纸上会是什么样子？好吧，当你谈到已经众所周知的方法时，你可以像前面描述的那样说出来然后给读者参考，我在这里给你举两个例子。它有助于简洁明了。让读者生活更轻松的另一种方法是使用流程图或表格来帮助简化方法的解释。您在临床研究中看到的一个常见流程图是参与者流程图，它显示了参与者如何完成您的研究。在这里，有174人被要求参加，103人报名，97人完成了所有实验。你可以看到，收集信息非常容易。从这样的图表中构成，想象一下文本中是否显示了相同的信息。很难通读和理解。而且读起来也会很无聊。图片传达此类信息的效率要高得多。现在，你的评论我们将在论文中看到这样的参与者流程图。但是可能还有很多其他例子我们应该更多地使用图表。如果你的研究有复杂的实验方案、复杂的药物剂量，那么在图表或表格中这些信息可能会更好。因此，要有创造力，寻找可以直观地呈现实验细节的实例。方法部分的动词时态与结果部分中的动词时态完全相同。你要报告已经用过去时完成的方法，因为它们已经完成了。因此，我们进行了测量、入学、分析等等。但是你要用现在时来描述论文中数据的呈现方式。因为当读者阅读论文时，数据仍然以这种方式呈现。因此，你可以说数据汇总为，请注意那里的被动语态。这是用现在时的，因为当读者阅读论文时，数据仍然是这样汇总的。好吧，所以我一直在提醒你注意被动动词的使用。但是现在，我要告诉你，在方法部分，使用被动语态，甚至是被动语态和主动语态的组合实际上是可以的。只要不让读者感到不安，就可以在被动和主动之间来回切换。我对“方法”部分中的被动语态表示满意，原因有两个。一是在被动语态中，它强调的是衡量了什么，做了什么，而不是谁做的。可以说，做了什么比谁做了更重要。例如，测量了口腔温度。那是被动语态。这强调的是口腔温度，而不是测量口腔温度的研究人员。这里的主动声音是我们测量了口腔温度。没关系，我想它更生动，但是再说一遍，强调兴趣的物质方法或变量，人们可能会争辩说你想在方法部分强调这种材料或方法。我认为可以在这里使用被动语态的另一个原因是，大多数人不会逐字阅读方法部分。因此，我认为，如果方法部分有点无聊也没关系。你可以预计，你的读者只会浏览该方法的部分，了解他们想要更多信息的关键内容。另外，在主动语态中，方法部分的结尾可能是大多数以we开头的句子。如果你试着把它放在主动语态中，你会有很多东西被我们衡量。我们观察，我们分析。有很多句子以we开头没关系，但也有点无聊。而且，如果你很有创造力，你可以想办法避免每句话都以we开头，但我不确定是否值得付出这样的努力。因此，仅举一个方法部分的例子，里面有很多被动语态和行话。我们知道这些肽是由生物聚合物核心设施合成的。现在，我们在这里有很多行话，我们得到了另一个被动的声音，被耦合到钥匙孔帽贝上。Hemocyanin，我不知道那是什么，但是这里的行话还可以，我们需要这里的行话。再说一遍，我认为把它放在被动语态里是可以的。为了给你举一个在方法部分使用主动语音的示例，你可以在方法部分使用主动语态。这里有一个有趣的例子，它主要依赖于主动语音。对于这个单元，我将从《英国医学杂志》、《英国医学杂志》的圣诞专刊中举几个例子。而且，如果你不熟悉《英国医学杂志》的圣诞专刊，它会发表幽默的研究。因此，它们提供了一些有趣的例子。这来自一篇关于学术垃圾邮件的论文。为了给你介绍一下背景，我和许多科学家一样，每天都会收到多封电子邮件，要求我向某期刊提交论文或参加会议。而且其中大多数与我的工作完全无关，基本上是垃圾邮件。然后我就删除了这些。但是在2016年《英国医学杂志》的圣诞节号中，为了好玩。因此，研究人员实际上更系统地研究了这种现象，以下是他们结果部分中的一段。他们写道，我们评估了每个收集阶段收到的垃圾邮件数量。对在2014年4月、2014年6月和2015年4月收到的垃圾邮件进行了详细分析。调查人员将他们的垃圾邮件和邀请函评为与他们的学术生涯无关、低、中或高度相关。我们确定了重复的垃圾邮件邀请的数量。如果可能，我们会记录出版商的期刊邀请和会议邀请的组织机构。最后，我们进行了定性分析。专注于令人难忘的垃圾邮件。我认为这很好用。它主要出现在第二句话的主动语音通知中。确实会切换到被动语态，所以再说一遍，如果它对你的读者来说不太刺耳的话，可以切换。你会注意到，他们最终也经常使用我们作为句子的主题。但我觉得它读起来不错而且很容易理解。他们有许多以we开头的句子也没关系。因此，当然有很多方法可以将方法放在主动语音中，选择权完全取决于你。最后，我将详细介绍学术垃圾邮件。我将在即将推出的一些模块中以这项关于学术垃圾邮件的研究为例。再说一遍，它来自《英国医学杂志》的圣诞专刊，所以，它本来是幽默的。这是一篇简短的论文，准确地遵循了科学手稿的这种标准格式，而且很有趣，所以它就是一个很好的例子。因此，为了让你了解我每次提出这项研究的背景，我今天进入我的邮箱，拿出了我昨天收到的两封学术垃圾邮件。我在这里给你看这些，这样当我提及这项学术垃圾邮件研究时，你就会知道我在说什么。这里左边的第一个设置得很重要，上面写着，当天的问候，希望你一切顺利，当天的问候之后有两个感叹号。在编辑委员会成员和组委会的支持下，我们欢迎你的到来，你可以看到这篇文章的语法不正确，我们希望你能作为主旨发言人参加这个盛大的活动。右边的那个，非常相似。它说，愿你在2017年发表职业生涯中最好的论文，获得最多的引文。我们真诚地希望这是真的，今年还有更多美好的事情发生在你身上。你可以看到这些非常有趣，而且显然是垃圾邮件。你明白了。因此，本周我要举的一篇论文将是关于学术垃圾邮件的。