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学识拓展·ACTIVE LEARNING

数学

Mathematics

外语教学与研究出版社
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数学
Mathematics

Emily Hutchinson (美) 著

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学识拓展——数学

Emily Hutchinson (美) **著**

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写给同学的话

申蔷

在新世纪，学好英语的重要性毋庸质疑，但在倡导素质教育的今天，如何提高学习英语的效率，如何能够学以致用，无疑仍是同学们所面临的一大难题。虽说条条大路通罗马，但最好不要走弯路，更不要误入歧途。

国家《英语课程标准》要求初三毕业达到国家五级水平，高三毕业应达到七级水平。在五级的总体目标中有这样的要求：能就日常生活的各种话题与他人交换信息并陈述自己的意见；七级标准的要求就更进了一步，即能就较广泛的话题交流信息，提出问题并陈述自己的意见和建议。

由此可见，学习英语的重要目的是交流，而交流的内容应该丰富多彩、并与我们的生活紧密相关，学习英语应该是一个艰苦而快乐的过程。基于这种想法，几经筛选，我在培生教育出版公司的出版物中发现了以下四个系列的图书，首先吸引我的是它们的系列书名：Active Learning，Life Skills，A Money Matters Guide 和 Everyday Health。通过仔细阅读，我惊喜地发现它们无论是语篇内容，还是涉及的知识领域以及语言难度，都非常适合广大中学生使用。

这套丛书很好地体现了学科融通的教育理念，语篇紧密结合实际生活，通过完成一个个活动，使同学们既丰富了相关的课外知识，又掌握了一定的实际技能，而当同样的场景在生活中再次呈现的时候，我们就会快速地从大脑中提取相应的信息来有效地应对。也就是说，通过学习这套丛书同学们可以达到学习语言和增强自身适应社会能力的双重目的。经过系统的学习，同学们的综合素质无疑会得到显著的提高，而这也正是我将本丛书命名为“素质英语”的初衷。

愿同学们能够从《素质英语——中学英语选修课丛书》中获取给养、增长学识、完善技能，逐步提高自身的综合素质，以充沛的勇气和信心面对21世纪的诸多挑战！

序言

“学识拓展”系列丛书充分体现了国家《英语课程标准》的基本理念，即注重素质教育，以活动为中心，倡导体验参与。其特色在于各种知识和内容都是以活动的形式呈现，同学们通过参与各种活动，学习和体验有关交际艺术、社会科学、自然科学和数学等方面的知识和技能。大家在做中学，在学中做，借此把所学的知识与真实的现实生活有机地结合起来，达到学以致用、学习知识与培养能力相结合的目的。另外，书中一系列活动，还可以培养同学们的团队意识和合作精神，这些也是素质教育的重要组成部分。

本系列由四个分册组成：《交际艺术》、《社会科学》、《数学》和《科学》。《交际艺术》一书重点在于让同学们通过活动学习交际的艺术，比如交际生活艺术、阅读和文学艺术以及听说艺术。《社会科学》一书为同学们打开了一扇了解社会的窗口，让大家对世界文化、历史、地理以及经济学有所了解。《数学》则通过一些具体的活动，比如制定自己的预算，让大家应用基本的数学知识和技能来解决实际生活中的问题。《科学》的重点在于通过具体的活动让大家掌握有关生命科学、地球科学和物理科学等学科的相关知识和概念。

从内容上来讲，本系列具有很强的趣味性、知识性和实用性。所有的知识和概念都以活动的形式呈现出来，比如通过写支票的活动学习数学知识，希望这种让大家亲自参与活动的做法能够极大地激发同学们的学习积极性。本系列所覆盖的知识面非常广，包括社会政治、日常生活、文化习俗、文学艺术和科学技术等，有利于完善同学们的知识结构。然而它又不仅仅停留在简单的知识呈现这一层面上，而且注重知识的实用性，让同学们学会并利用所学的知识解决生活中的实际问题。比如，在《交际艺术》一书中，“细心的消费者”这一课告知你们广告制作者是怎样制作并利用广告来推销商品的，同学们学过之后自己就可以制作一个商业广告。在《科学》一书中，教会你们通过阅读气象图来计划一次旅行。

本系列侧重活动的内容而非语法知识，因此每课书的教学目标和练习

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都以内容为主，语言为辅。为了帮助同学们更好地理解语篇，改编时增加了导读、学习目标、文化背景、语言难点等。另外，每册书后还有“自我评价”和“相互评价”表，在学习过每个单元后同学们可以进行自我检测。而附在其后的“综合活动”则为大家提供了真实运用语言的良好机会。

本系列可作为初二、初三学生泛读课、选修课以及双语课的教材，也可作为英语自学者的辅助读物。我们相信这套体现最新教学理念的丛书对我国中学英语素质教育能够起到推波助澜的作用。

导学

数学在科技发展的过程中起着举足轻重的作用。对于广大中学生来讲，数学更是一门极为重要的基础课程。如何学好数学成为新世纪中学生所面临的重要任务之一。本书从日常生活出发设计了一系列具有趣味性的活动，让学生在完成活动的过程中，除了掌握数学知识以外，还能有意外的收获：激发学习兴趣，培养动手能力，唤起团队意识，锻炼日常独立生活能力。

本书正文共分为三部分。第一部分主要通过旅行、买东西、填写支票等来学习关于整数与分数的加减法。第二部分通过如何计算利息、计算人体所需蛋白质和热量等活动来熟悉关于整数与分数的乘除法。第三部分包括如何利用模型与图表来设计房间、分配蛋糕等，从而使同学们学会如何灵活运用模型和图表、节约开支、安排一天的时间等等。这一部分还通过玩七巧板游戏，教会大家认识许多基本几何图形及其英文名称。

另外，书后附有综合活动练习，用以复习书中所学过的有关加减乘除的内容，包括计算零钱、付账单和制作图表。希望同学们通过这些综合练习进一步深化所学的数学知识，培养自己解决实际问题的能力。

愿同学们在学习知识的同时，注重能力的培养，以适应高科技发展的需要。

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Unit 1 Adding and Subtracting
加法和减法

Activity 1
Framing[1] Photos 像框制作

Lead-in 导读

照片的尺寸有多种。从你最喜爱的照片中挑出尺寸不同的三张，然后为它们设计并制作一些好看的像框。

Learning Objectives 学习目标

You will be able to:

- Learn the addition of whole numbers.
- Recognize some terms about addition.
- Learn to use ruler and tape measure.

Culture Notes 文化背景

在用尺子测量物体时，往往不能得到精确值，而只能得到近似值，其间的差称为“误差”，又称“绝对误差”。绝对误差与精确值之比称为“相对误差”。

MAKE A PLAN 制定计划

Here is what you will need.

— paper
— pencil
— tape measure[2] or ruler
— calculator[3]
— cardboard[4]
— markers[5]
— photos
— scissors[6]
— supplies[7] to decorate[8] the frames

Review[9] the activity[10]. Estimate[11] how long it will take.

_____

I will work

_____ by myself _____ with a partner _____ in a group

Language Notes | 语言难点

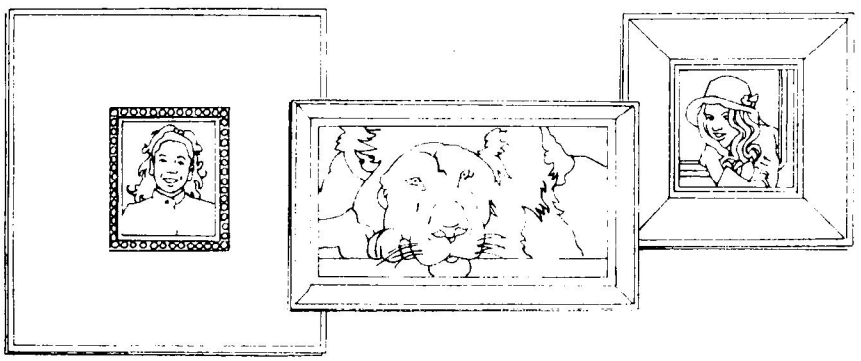
1. frame /freɪm/ *v.* 给……装框 *n.* 框架
2. tape measure /'meʒə(r)/ 卷尺
3. calculator /'kælkjʊleɪtə(r)/ *n.* 计算器
4. cardboard /'kɑ:dbɔ:d/ *n.* 薄纸板
5. marker /'mɑ:kə(r)/ *n.* 记号笔
6. scissor /'sɪzə(r)/ *n.* (常作复数)剪刀
7. supply /sə'plaɪ/ *n.* (常作复数)必需品，供应品
8. decorate /'dekəreɪt/ *v.* 装饰；修饰
9. review /rɪ'vju:/ *v.* 回顾，复习
10. activity /æk'tɪvɪti/ *n.* 活动
11. estimate /'estɪmeɪt/ *v.* 估计；估量

Did You Know... → 你知道吗?

There are special cameras[1] that can take pictures of different sizes. One camera takes pictures that are very long. These are good for showing a piece of land, like this.

Doing Research → 进行研究

Bring to class three photos. They should be of different sizes. You may want to use only part of a photo. Check[2] with your family to make sure[3] that you may cut this photo. You can cut pictures of different sizes from magazines[4] also.



The frames that you make can be as wide[5] or as narrow[6] as you want. Frames can be as small as a half inch[7] around the photo. They can be as big as three inches or more. It's up to you[8].

Language Notes | 语言难点

1. camera /'kæmərə/ *n.* 照相机
2. check /tʃek/ *v.* 检查; 核对
3. make sure 设法确保
4. magazine /ˌmægə'zi:n/ *n.* 杂志
5. wide /waɪd/ *adj.* 宽的
6. narrow /'nærəʊ/ *adj.* 窄的
7. inch /ɪntʃ/ *n.* 英寸
8. be up to 取决于

Collecting Information → 收集信息

Plan your frames. Measure[1] each photo. Write the measurements[2] here:

Photo #1: length[3] _____ width[4] _____
Photo #2: length _____ width _____
Photo #3: length _____ width _____

Analyzing[5] Information → 分析信息

Now plan your frame for each photo. Decide[6] on a size for your frames.

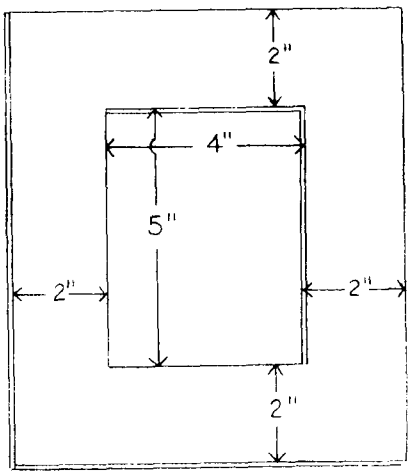
Here is an example of how to do this. The frame below[7] is 2 inches in width. The photo inside[8] it is 4 inches in width by[9] 5 inches in length.

1. Add[10] the width of the photo to the width of the frame on each side. What is the total[11] width?

_____

2. Add the length of the photo to the length of the frame on each side. What is the total length?

_____



Those numbers are the outside measurements of the cardboard you would need to make that frame for this photo.

3. What is the smallest size of the cardboard you could use to make the frame? Check the correct answer:

_____ 6 inches by 7 inches
_____ 8 inches by 9 inches
_____ 10 inches by 12 inches

Use the same steps to find the cardboard size that you will need for your frames. Fill in[12] the answers on the next page.

Language Notes | 语言难点

1. measure /'meʒə(r)/ *v.* 测量
2. measurement /'meʒəmənt/ *n.* (量得)尺寸，大小
3. length /leŋθ/ *n.* 长度
4. width /wɪdθ/ *n.* 宽度
5. analyze /'ænəlaɪz/ *v.* 分析
6. decide /dɪ'saɪd/ *v.* 决定，选定
7. below /bɪ'ləʊ/ *adv.* 在下面
8. inside /ˌɪn'saɪd/ *prep.* 在……里面
9. by /baɪ/ *prep.* (表示面积)乘
10. add /æd/ *v.* 加；增加
11. total /'təʊtl/ *adj.* 总的；总计的
12. fill in 填写

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Photo #1

Length of photo _____

Length of the top and bottom[1] of the frame added together[2] _____

Length of frame added to length of photo _____

Width of photo _____

Width of the left and right sides of the frame added together _____

Width of frame added to width of photo _____

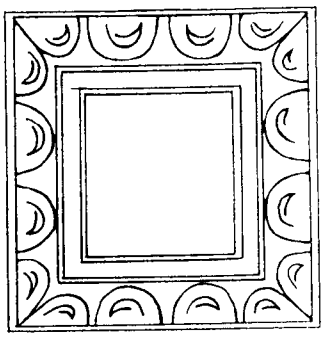


Photo #2

Length of photo _____

Length of the top and bottom of the frame added together _____

Length of frame added to length of photo _____

Width of photo _____

Width of the left and right sides of the frame added together _____

Width of frame added to width of photo _____

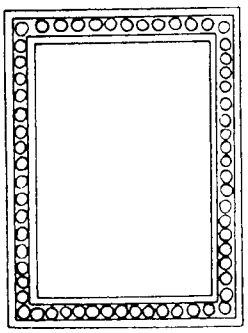


Photo #3

Length of photo _____

Length of the top and bottom of the frame added together _____

Length of frame added to length of photo _____

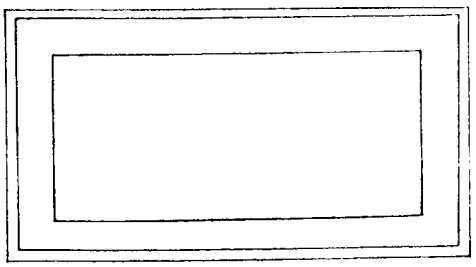
Width of photo _____

Width of the left and right sides of the frame added toegther _____

Width of frame added to width of photo _____

Showing What You Know → 做做看

Make the frames for your photos. Then glue[3] each photo in the middle of a frame. Measure to make sure that your borders[4] are even[5]. Decorate the frames any way you like.



Language Notes 语言难点

1. bottom /'bɒtəm/ *n.* 底；底部
2. together /tə'geðə(r)/ *adv.* 共同；一起
3. glue /gluː/ *v.* 胶合；粘贴
4. border /'bɔːdə(r)/ *n.* 边，缘
5. even /'iːvn/ *adj.* 平的；平滑的

Activity 2
Let's Take a Trip 去旅行

Lead-in 导读

如果你打算和朋友去旅行，那么在制定旅行计划时需要了解哪方面的信息呢?

Learning Objectives 学习目标

You will be able to:

- Learn how to add and subtract whole numbers.
- Learn to make and use charts.

MAKE A PLAN 制定计划

Here is what you will need.

— paper — pencil

— map — calculator

Review the activity. Estimate how long it will take.

I will work

_____ by myself _____ with a partner _____ in a group

Did You Know... → 你知道吗?

Many places would be good for a class trip. Check the ones that interest[1] you.

_____ art[2] museum[3] _____ natural history museum

_____ picnic in a park _____ nature walk[4]

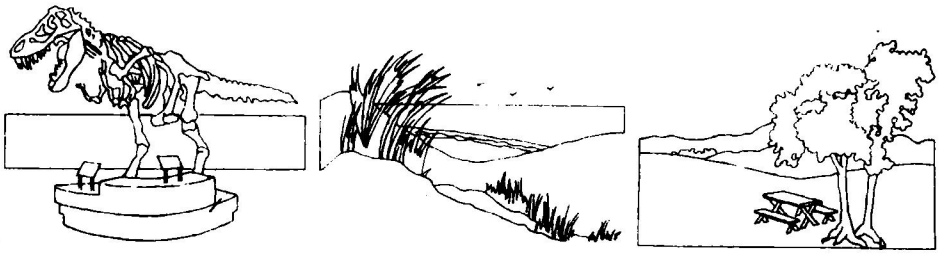
_____ aquarium[5] _____ zoo

Language Notes | 语言难点

1. interest /'ɪntrɪst/ *v.* 使感兴趣
2. art /ɑːt/ *n.* 艺术，美术
3. museum /mjuː'ziːəm/ *n.* 博物馆
4. nature walk 自然旅行
5. aquarium /ə'kweəriəm/ *n.* 水族馆

_____ beach[1]
_____ swimming pool
_____ library
_____ science museum

_____ park
_____ city hall
_____ skyscraper[2]
_____ other_____



Doing Research → 进行研究

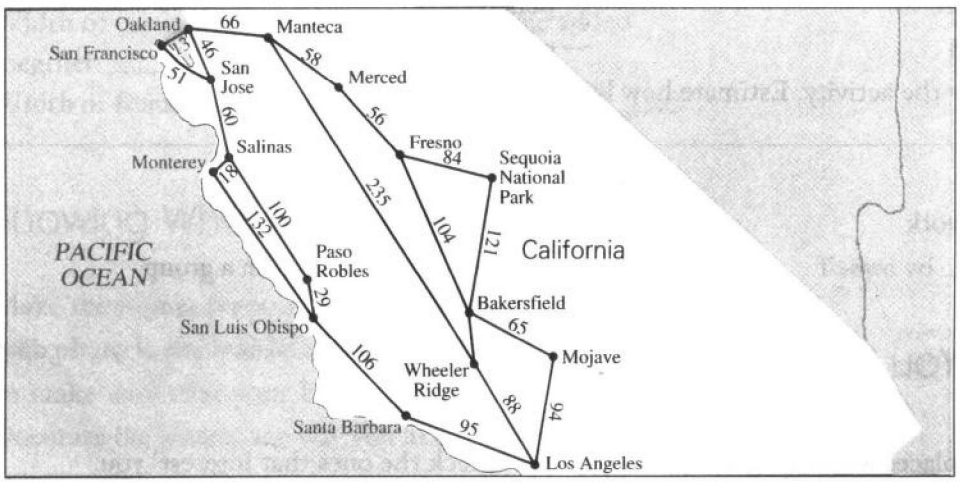
Some maps have numbers in small type on the routes[3]. These numbers tell you the miles[4] between points on the map. Imagine[5] that you wanted to know the distance[6] between two cities. What should you do with the numbers along the route? Check your answer.

_____ Add _____ Subtract[7]

Explain[8] your choice.[9]

_____

_____



Language Notes | 语言难点

1. beach /biːtʃ/ *n.* 海滩
2. skyscraper /'skaɪˌskreɪpə(r)/ *n.* 摩天大楼
3. route /ruːt/ *n.* 路线；路程
4. mile /maɪl/ *n.* 英里
5. imagine /ɪ'mædʒɪn/ *v.* 设想；想像
6. distance /'dɪstəns/ *n.* 距离
7. subtract /sʌb'trækt/ *v.* 减
8. explain /ɪk'spleɪn/ *v.* 解释；说明
9. choice /tʃɔɪs/ *n.* 选择

Use the map above[1] to answer these questions.

1. How many miles is it from Fresno to Bakersfield? _____
2. Say you went from Frseno to Sequoia National Park to Bakersfield. How many miles did you travel? _____
3. Make up[2] a route between three points based on[3] on this map. Give it to a classmate to find the distance of this trip.

_____

_____

_____

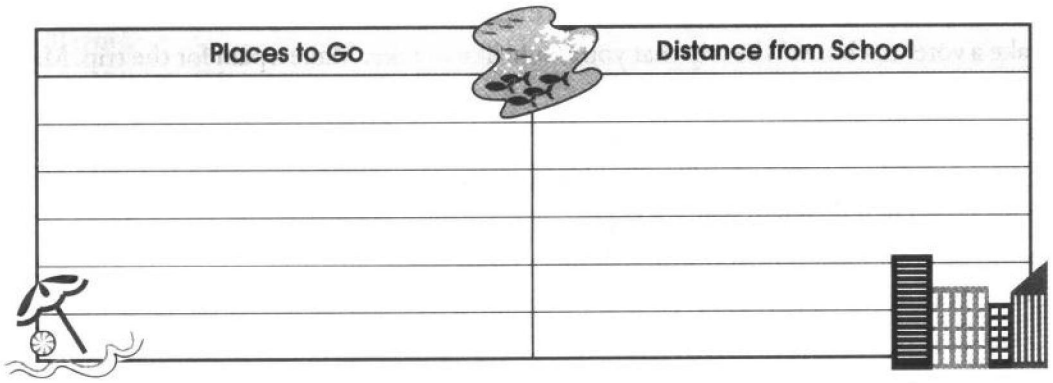
Collecting Information → 收集信息

Find a map of your area[4]. Some places you might look for such a map are listed[5] below. After you find the map, check the place where you found it.

_____ library
_____ home
other _____

_____ gas station[6]
_____ store

Look at your map. Find places your class could go in one day. These places should probably be less than 100 miles from your school. In column[7] 1 below, list those places. Figure out[8] how far each place is from your school. Use the scale[9] of miles or the numbers on the map to find the distances. In column 2, write how far the place is from your school.



Language Notes | 语言难点

1. above /ə'bʌv/ *adv.* 在上面
2. make up 草拟；编制
3. be based on 以……为基础
4. area /'eəriə/ *n.* 地区；地域
5. list /lɪst/ *v.* 列举
6. gas station 加油站
7. column /'kɒləm/ *n.* 列，栏
8. figure /'fɪgə(r)/ out 计算出
9. scale /skeɪl/ *n.* 标度；刻度

Analyzing Information → 分析信息

Look at the trips that you listed. Which one can your class afford[1] to take? To figure this out, you will need to know what your budget[2] is. How much can your class spend? Check the answer.

_____ less than $20 _____ between $20 and $50
_____ between $50 and $100 _____ between $100 and $150
_____ other _____

How much would each trip cost? To find out, fill out[3] the chart[4] on the next page.

Places to Go	Transportation[5] Cost	Food Cost	Other Costs	Total

Showing What You Know → 做做看

Look at your budget. Then look at the cost of each trip. Which trips can your class afford? Take a vote[6] to choose[7] the trip that you would like to take. Make a plan for the trip. Make sure your plan includes[8] these things:

◇ the time you will leave the school
◇ how you will get there (walk, school bus, parents' cars)
◇ what you will do when you are there
◇ the time you will return to the school
◇ the cost of transportation
◇ the cost of food and drink
◇ other costs, such as ticket prices[9].

Language Notes | 语言难点

1. afford /ə'fɔːd/ *v.* 买得起；担负得起
2. budget /'bʌdʒɪt/ *n.* 预算
3. fill out 填写；填好
4. chart /tʃɑːt/ *n.* 图；图表
5. transportation /ˌtrænspɔː'teɪʃən/ *n.* 运输
6. vote /vəʊt/ *v.* 选举；投票
7. choose /tʃuːz/ *v.* 选择；挑选
8. include /ɪn'kluːd/ *v.* 包括；包含
9. price /praɪs/ *n.* 价格，价钱

Unit 1 Adding and Subtracting 加法和减法

Activity 3

Finding Bargains[1] 货比三家

Lead-in 导读

你知道在什么地方能买到便宜的物品，怎样才能买到吗？学完此文以后，你就能找到秘诀。

Learning Objectives 学习目标

You will be able to:

- Learn the addition, the multiplication and the division of money.
- Compare the unit price of an item.

MAKE A PLAN 制定计划

Here is what you will need.

— paper — pencil

— calculator — newspaper ads[2]

Review the activity. Estimate how long it will take.

_____

I will work

_____ by myself _____ with a partner _____ in a group

Did You know... → 你知道吗?

We didn't always shop as we do today. In the past, clerks[3] would bring items[4] to shoppers.

In 1916, the first self-service[5] grocery[6] store was opened. In a self-service store, people pick up[7] their own items from a shelf.

By the 1920s, we began calling these stores supermarkets[8]. But at all these stores, smart[9] shoppers have always looked for good buys.

Language Notes | 语言难点

1. bargain /'bɑ:gɪn/ *n.* 廉价货
2. ad /æd/ *n.* (口) 广告
3. clerk / klɑ:k/ *n.* 店员，售货员
4. item /'aɪtəm/ *n.* 商品
5. self-service /ˌself'sɜ:vɪs/ *adj.* 自助的
6. grocery /'grəʊsəri/ *n.* 食品，杂货
7. pick up 挑选
8. supermarket /'sju:pəmɑ:kɪt/ *n.* 超市
9. smart /smɑ:t/ *adj.* 聪明的；精明的

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