

PHYSICS TEACHING ISSN: 1002-0748

CN31-1033 / G4

物理教学

2018.9

● 中国科学技术协会主管 ● 中国物理学会主办 ● 中国科协优秀期刊 ● 中等教育类核心期刊

- 摭谈高中物理核心素养生成的“四点”
- 基于 Lab Studio 的交流电峰值和有效值关系的定量实验研究
- 导体导电再探究与导体检测仪发明的教学
- 基于比热容的物理实质研究热力学系统的热量及温度的临界关系

9

中国物理学会
Chinese Physical Society

2018

物理教学

PHYSICS TEACHING

第40卷 第9期
(总第448期)
月刊(1978年创刊)

主管:中国科学技术协会
主办:中国物理学会
协办:上海市物理学会
编辑出版:《物理教学》编辑部

主编:陈群
副主编:陈树德 胡炳元 徐淀芳
蒋最敏 蔡铁权
编辑部主任:黄燕萍
封面题字:谢稚柳

目
录

●教学论坛●

 掂谈高中物理核心素养生成的“四点” 陈野(2)

 论科学本质教学的内容与途径 王耀村(6)

 物理核心素养导向下的“向心加速度”复习课 钱奇兰(11)

 运用思维地图,助力物理规律教学——以“导体的电阻”教学为例 徐婷婷(17)

 显化科学方法视域下的物理概念教学研究——以“磁感应强度”教学为例 贺桐杰 王笑君(20)

●物理实验室●

 基于 Lab Studio 的交流电峰值和有效值关系的定量实验研究 万军(23)

 探究连续折射过程中沿曲线传播的光 李艳杰(26)

 如何使用 DIS 数字化实验系统和 APP 开发学生实验——以“牛顿管”实验为例 刘玲(29)

 用 DIS 测弹簧的倔强系数和质量 董琳 倪敏 韩唯伟(31)

 基于单摆和 DIS 信息技术的向心力探究活动设计方案 周晓松 洪朝晖 邵友娣(33)

●教研巡礼:浙江●

 聚焦逆向设计 促进本质理解——UbD 理念在“浮力”教学中的应用 周华松(36)

 基于“5E”教学模式促进科学本质理解的教学实践——以“磁场”教学为例 汪晓(40)

 现象、模型、结论:基于科学本质的科学教学 阮庆元(42)

●初中园地●

 导体导电再探究与导体检测仪发明的教学 邢海根(45)

 基于物理实验,促进问题解决——以浮力为例谈实验在习题教学中的应用 李学海 刘昕(48)

 初中物理数值计算类习题解题规律的探索 刘洪勇(52)

●教研员论坛●

 从 2017 江苏高考 14 题谈静摩擦力与滑动摩擦力的区别 徐超 盛云生(55)

●命题与解题●

 对物体运动速度的分类讨论 张晓丽(57)

 由一次碰撞引发的思考 朱爱军 张静(60)

 基于比热容的物理实质研究热力学系统的热量及温度的临界关系 余杰 冉婷(63)

●高考与竞赛●

 五法解决变质量柔绳问题 祝智浩(66)

 对一道高考图象题的研究和拓展 蔡亮(68)

 能力立意 素养凸显——赏析 2018 年 4 月浙江选考加试物理卷压轴题 潘智方 林许新胜(70)

●国外教学●

 中美高中物理教材“质点”模型内容的比较 吴宏伟 焦振兰 阚加周(73)

●生活与物理●

 静电散花实验的改进 徐忠岳 梁旭 李海洋(78)

编辑部地址:上海市中山北路 3663 号
(华东师范大学物理与材料科学学院内)
邮政编码:200062
电话(传真电话):(021)62232813
E-mail:wljx@phy.ecnu.edu.cn
网址:http://wljx.ecnu.edu.cn
排版:南京前锦排版服务有限公司

印刷:江苏省宜兴市德胜印刷有限公司
国内发行:上海市报刊发行局
国外总发行:中国国际图书贸易集团有限公司
(北京 399 信箱)
发行方式:公开发行
订购处:全国各地邮局
广告许可证:07017

国际标准连续出版物号:
ISSN:1002-0748
报刊代号:4-284
国内统一连续出版物号:
CN31-1033/G4
国外发行代号:M356
出版日期:2018年9月18日
国内定价:12.00元

Physics Teaching

9

2018

Monthly

(Founded in 1978)

Vol. 40, No. 9

(Cumulative 448)

Sponsor:

Chinese Physical Society

Editor:

Editorial Board of

Physics Teaching,

Chinese Physical Society

Chief Editor:

Chen Qun

Office:

3663 N. Zhongshan Road

Shanghai 200062

(East China Normal University)

Telephone:

86-21-62232813

Fax: 86-21-62232813

Email: wljx@phy.ecnu.edu.cn

http://wljx.ecnu.edu.cn

Distributor:

China International

Book Trading

Corporation(P. O. Box399, Beijing)

Code Number:

M356

Date of Publication:

9-18-2018



Teaching Forum

- On the "four points" of the core literacy generation in senior physics Chen Ye(2)
- The content and ways of teaching on the essence of science Wang Yaocun(6)
- The review course of centripetal acceleration under the physics core accomplishment Qian Qilan(11)
- Use the mental map to help physics teaching, taking the teaching of conductor resistant as an example Xu Tingting(17)
- The teaching of physics concept in the visual field of the manifestation scientific method, taking the teaching of magnetic induction as an example He Tongjie, Wang Xiaojun(20)

Physics Laboratory

- Quantitative experiment study on the relationship between AC peak value and RMS value based on Lab Studio Wan Jun(23)
- Explore the propagation of light along a curve in the continuous refraction medium Li Yanjie(26)
- How to use DIS digital experiment system and APP to design students' experiments Liu Ling(29)
- Measure stiffness and quality of a spring with the DIS Dong Lin, Ni Min, Han Weiwei(31)
- Design schemes of centripetal force exploration activities based on a single pendulum and DIS information technology ... Zhou Xiaosong, Hong Chaohui, Shao Youdi(33)

Pilgrimage of Teaching Research: Zhejiang

- Focusing on the reverse design to promote the essential understanding Zhou Huasong(36)
- Teaching practice of understanding the nature of science based on 5E teaching mode, taking "magnetic field" teaching as an example Wang Xiao(40)
- The science teaching based on the nature of science Ruan Qingyuan(42)

Junior Physics

- The teaching of conducting reinvestigation and conductor detectors Xing Haigen(45)
- Taking "buoyance" teaching as an example to discuss the application of experiments in problem teaching Li Xuehai, Liu Xin(48)
- Study on the problem solving rules of numerical calculation exercises in junior physics Liu Hongyong(52)

Education Inspectors Forum

- Discussion on the difference between static friction force and slide friction force from the 14th problem in 2017 Jiangsu high-exams Xu Chao, Sheng Yunsheng(55)

Questions Assigned and Solved

- Discussion on the classification of object velocity Zhang Xiaoli(57)
- A thought caused by a collision Zhu Aijun, Zhang Jing(60)
- The critical relationship between heat and temperature of thermodynamic systems based on the study of specific heat capacity Yu Jie, Ran Ting(63)

High-Exams and Competition

- Five ways to solve the problems of flexible rope with variable quality Zhu Zhihao(66)
- Research on an image problem of high-exams Cai Liang(68)
- Appreciation and analysis of the last problem in April 2018 Zhejiang high-exams Pan Zhi, Fang Lin, Xu Xinsheng(70)

Teaching Abroad

- Analysis of the content of particle model in Chinese and American textbooks in middle school Wu Hongwei, Jiao Zhenlan, Nao Jiazhou(73)

Physics in Daily Life

- Improvement of experiments on electrostatic dispersion Xu Zhongyue, Liang Xu, Li Haiyang(78)

Physics Teaching

9

2018

Monthly

(Founded in 1978)

Vol. 40, No. 9

(Cumulative 448)

Sponsor:

Chinese Physical Society

Editor:

Editorial Board of

Physics Teaching,

Chinese Physical Society

Chief Editor:

Chen Qun

Office:

3663 N. Zhongshan Road

Shanghai 200062

(East China Normal University)

Telephone:

86-21-62232813

Fax: 86-21-62232813

Email: wljx@phy.ecnu.edu.cn

http://wljx.ecnu.edu.cn

Distributor:

China International

Book Trading

Corporation(P. O. Box399, Beijing)

Code Number:

M356

Date of Publication:

9-18-2018



Teaching Forum

- On the "four points" of the core literacy generation in senior physics Chen Ye(2)
- The content and ways of teaching on the essence of science Wang Yaocun(6)
- The review course of centripetal acceleration under the physics core accomplishment Qian Qilan(11)
- Use the mental map to help physics teaching, taking the teaching of conductor resistant as an example Xu Tingting(17)
- The teaching of physics concept in the visual field of the manifestation scientific method, taking the teaching of magnetic induction as an example He Tongjie, Wang Xiaojun(20)

Physics Laboratory

- Quantitative experiment study on the relationship between AC peak value and RMS value based on Lab Studio Wan Jun(23)
- Explore the propagation of light along a curve in the continuous refraction medium Li Yanjie(26)
- How to use DIS digital experiment system and APP to design students' experiments Liu Ling(29)
- Measure stiffness and quality of a spring with the DIS Dong Lin, Ni Min, Han Weiwei(31)
- Design schemes of centripetal force exploration activities based on a single pendulum and DIS information technology ... Zhou Xiaosong, Hong Chaohui, Shao Youdi(33)

Pilgrimage of Teaching Research: Zhejiang

- Focusing on the reverse design to promote the essential understanding Zhou Huasong(36)
- Teaching practice of understanding the nature of science based on 5E teaching mode, taking "magnetic field" teaching as an example Wang Xiao(40)
- The science teaching based on the nature of science Ruan Qingyuan(42)

Junior Physics

- The teaching of conducting reinvestigation and conductor detectors Xing Haigen(45)
- Taking "buoyance" teaching as an example to discuss the application of experiments in problem teaching Li Xuehai, Liu Xin(48)
- Study on the problem solving rules of numerical calculation exercises in junior physics Liu Hongyong(52)

Education Inspectors Forum

- Discussion on the difference between static friction force and slide friction force from the 14th problem in 2017 Jiangsu high-exams Xu Chao, Sheng Yunsheng(55)

Questions Assigned and Solved

- Discussion on the classification of object velocity Zhang Xiaoli(57)
- A thought caused by a collision Zhu Aijun, Zhang Jing(60)
- The critical relationship between heat and temperature of thermodynamic systems based on the study of specific heat capacity Yu Jie, Ran Ting(63)

High-Exams and Competition

- Five ways to solve the problems of flexible rope with variable quality Zhu Zhihao(66)
- Research on an image problem of high-exams Cai Liang(68)
- Appreciation and analysis of the last problem in April 2018 Zhejiang high-exams Pan Zhi, Fang Lin, Xu Xinsheng(70)

Teaching Abroad

- Analysis of the content of particle model in Chinese and American textbooks in middle school Wu Hongwei, Jiao Zhenlan, Nao Jiazhou(73)

Physics in Daily Life

- Improvement of experiments on electrostatic dispersion Xu Zhongyue, Liang Xu, Li Haiyang(78)