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Ingenuity for life

Greenpower Challenge

The Greenpower Challenge

Our focus

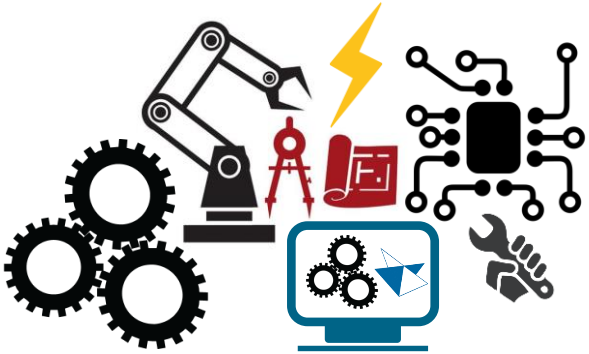
Meeting the needs of Education

- Improving student attainment
- Improving student engagement
  - Inspirational (motivational)
  - Scalable (suitable for all learning abilities)
- Effective STEM education (cross-curricular)
- Character education
- Team-centric

Our focus

Meeting the needs of Industry

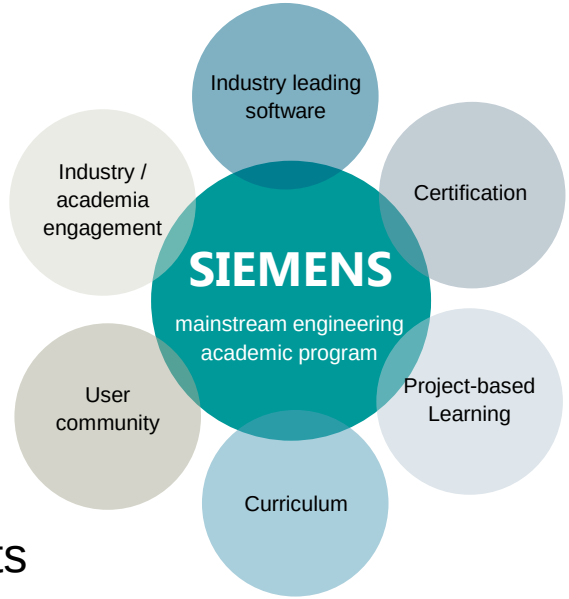
- Increase the number of students studying the STEM subjects
- Increase the number of students entering the engineering industries
- Workforce development
  - Industry-relevant
  - Practical, hands-on experience
  - Use of industry-leading software and technology
  - Developing key soft-skills



Siemens academic programme: objectives

A sustainable future

- Innovation driven economies
- Increase levels of technological literacy
- Encourage and support life-long learning



Partnership with education

- Industry leading software & certification
- Support teaching & learning of the STEM subjects
- Support engaging & inspirational project-based learning
- Emphasis on applied learning
- Character education
- Workforce development

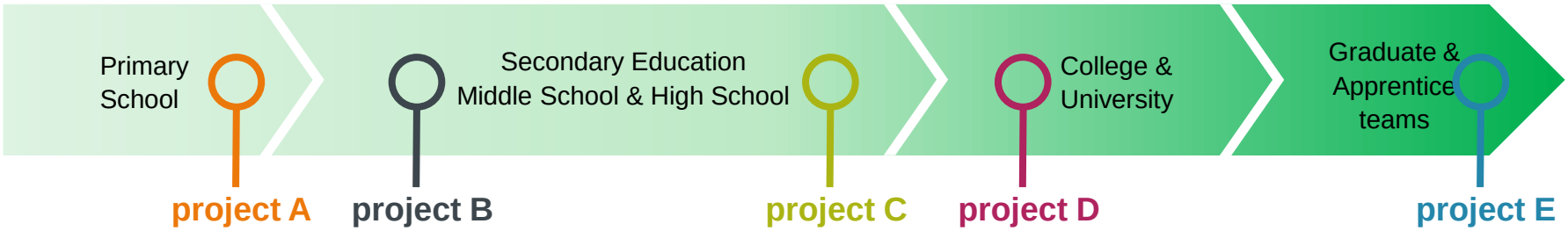
Project Based Learning

Used extensively in all levels of education

- Highly effective method of teaching & learning
- Encourages cross-curricular education
- Widespread industry support & coverage

Potential limitations

- Projects focused on one level of education
- Poor continuity
- Limited scalability



Greenpower Electric Car Challenge

A successful and highly-effective, international team-based academic project where students design and build a single-seat electric car and compete in head-to-head races

Design

- Multi-disciplinary design and engineering
- Using Siemens industry-leading software

Build

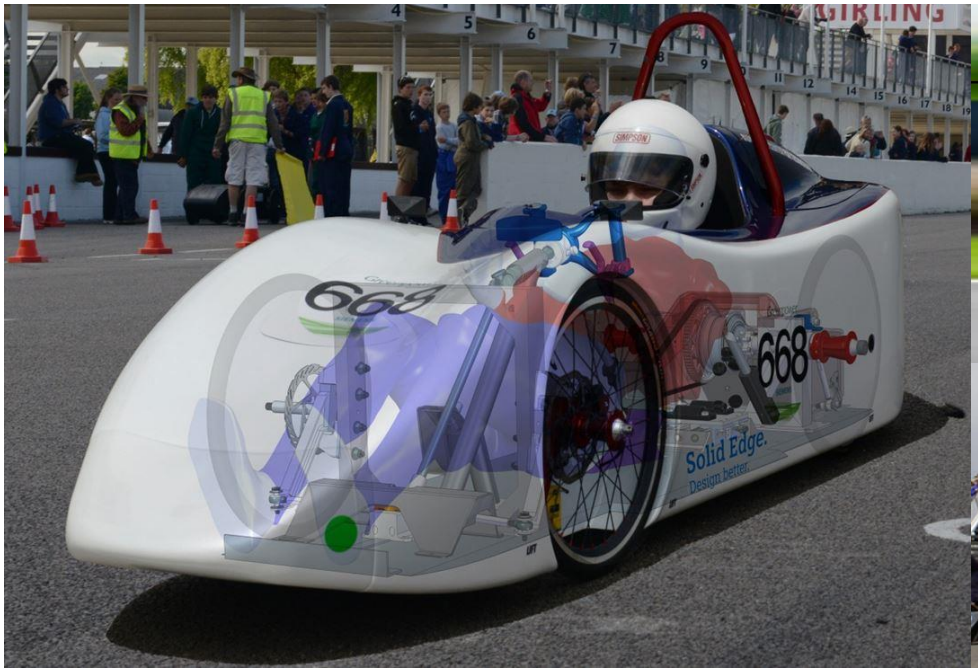
- Practical, hands-on production and assembly
- Performance testing, fault diagnosis, and development

Race

- Head-to-Head racing
- Iterative development: design-test-improve

Greenpower Electric Car Challenge

A successful and highly-effective, international team-based academic project where students design and build a single-seat electric car and compete in head-to-head races



Greenpower Electric Car Challenge

Academically proven

- STEM focused, cross-curricular and team-centric
  - Emphasis on applied-learning
- Categories covering the entire range of education
  - Learning continuity
- Suitable for all learning abilities
  - Scalable

STEM Science, Technology, Engineering, Mathematics

Greenpower INSPIRING ENGINEERS — Supported by SIEMENS

Strong industry support and engagement

- Siemens: Title Sponsor & Global Technology Partner
- Industry sponsors
- Industry teams

Primary School → Secondary Education Middle School & High School → College & University → Graduate & Apprentice teams

Greenpower categories

- Cars typically designed from scratch
- CAD: **Siemens Solid Edge / NX**
- Head-to-head racing
  - 60 minute race (max. dist.)
  - Qualification races & Final

- Graduate & Apprentice teams
- Cars design from scratch
- Head-to-head racing
  - 60 minute race (max. dist.)
  - Annual race (Final)

25

- Kit car or design from scratch
- Covers key areas of the STEM curriculum
- CAD: **Siemens Solid Edge / NX**
- Head-to-head racing
  - 2 x 90minute races – max distance covered)
  - Qualification races & Final

16

- Kit car (fully reusable)
- Covers key areas of the STEM curriculum
- CAD: **Siemens Solid Edge viewers**
- Suitable for multiple groups and fully reusable
- Team working

11

9

GreenpowerUSA categories

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FORMULA 24+

- Cars typically designed from scratch
- CAD: **Siemens Solid Edge / NX**
- Head-to-head racing
  - 60 minute race (max. dist.)
  - Qualification races & Final

THE CORPORATE CHALLENGE

- Graduate & Apprentice teams
- Cars design from scratch
- Head-to-head racing
  - 60 minute race (max. dist.)
  - Annual race (Final)

18

FORMULA 24

Formula 24

- Kit car or design from scratch
- Covers key areas of the STEM curriculum
- CAD: **Siemens Solid Edge / NX**

14

Formula 24 - intermediate

- Kit car
- Covers key areas of the STEM curriculum
- CAD: **Siemens Solid Edge / NX**

11

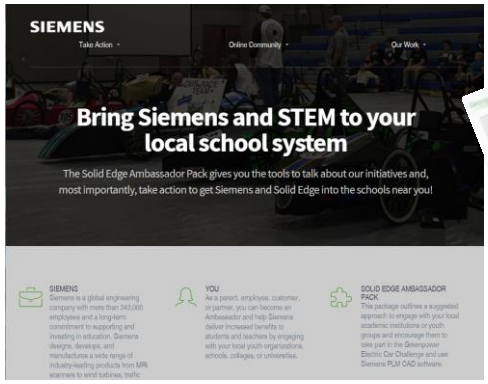
formula goblin

- Kit car (fully reusable)
- Covers key areas of the STEM curriculum
- CAD: **Siemens Solid Edge viewers**
- Suitable for multiple groups and fully reusable
- Team working

9

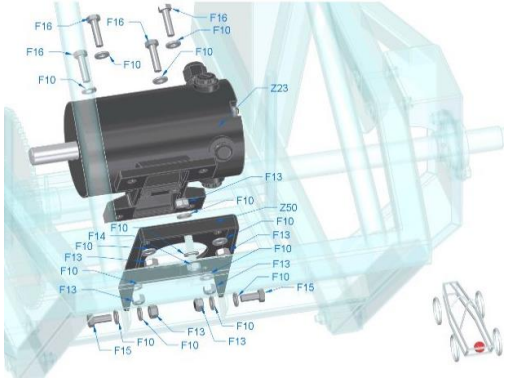
Supporting resources from Siemens

- Dedicated Greenpower webpage
  - www.siemens.com/plm/academic/greenpower
- Siemens Engineering & Design Award
- Dedicated Solid Edge Greenpower User community
- Online Siemens Ambassador Pack
- http://docs.plm.automation.siemens.com/docs/se/ap1/en_US/ambassador/index.html

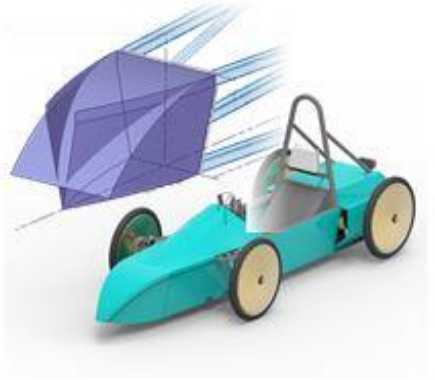


Supporting resources from Siemens

Formula 24 kit car Solid Edge dataset

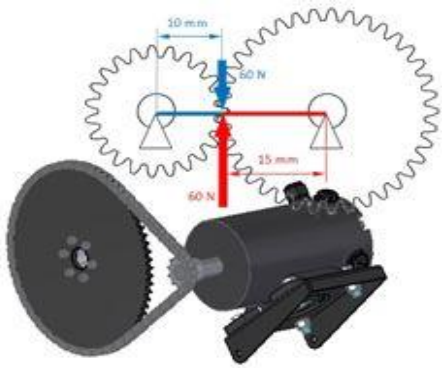


Formula 24 kit car online assembly guide

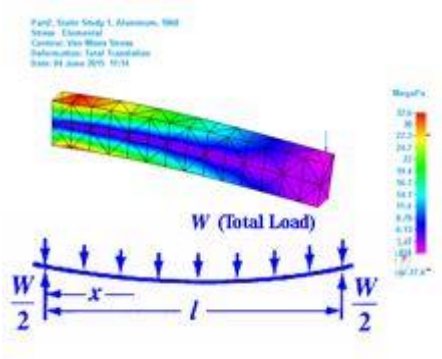


Introduction to surfacing

Steering wheel design project



Introduction to mechanical systems

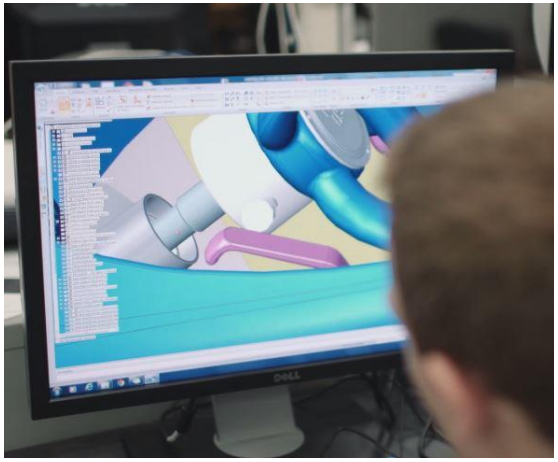


Introduction to FE Analysis

Greenpower: the key benefits

- High-quality and sustained student engagement
- Categories covering the entire range of education
- High level of female participation (~35%)
- Cross-curricular STEM project: applied learning
- Industry-leading and industry-relevant software and technology
- Running in 5 countries;
  - UK (www.greenpower.co.uk)
  - USA (www.greenpowerusa.net)
  - China (www.greenpowerchina.com)
  - Poland (http://greenpowerpolska.pl)
  - South Africa (www.greenpowerza.co.za)

Making a difference



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Success stories

Click the image to access the related YouTube video.

Key benefits

Key benefits for secondary education

Delivering academic value for middle schools and high schools

- Proven STEM project-based learning activity
- Truly cross-curricula
- Team-centric
- Modern and Industry-relevant
- International participation
- Inclusive: suitable for all learning abilities
- Scalable: categories for all levels of education (learning continuity)
- Large and growing range of resources

Improving student engagement and attainment

- Real-world multi-disciplinary engineering project
- inspirational and engaging project
- Applied learning
- Character education (development of key soft-skills)
- Improving employability: industry-relevant skills

Key benefits for post-secondary education

Delivering academic value for Colleges and Universities

- Affordable
- Multiple teams from one academic institution (involve more students)
- Ongoing development of vehicle
  - Cost-effective and provides project-continuity
- Head-to-head racing (multiple race events each year)
  - Student teams competing against industry teams
- Modern and industry-relevant
- Practical hands-on experience
- Multi-disciplinary (suitable for a wide range of engineering courses)
- High-level of female participation (~35%)
- Perfect outreach programme

Key benefits for industry

Industry relevant

- Modern, real-world engineering project
- Increasing the pipeline of engineering talent
- Multi-disciplinary project
- Applied learning (practical, hands-on)
- Workforce development
- Workplace skills including soft skills
- High level of female participation (~35%)

Benefits of industry involvement

- Identify and nurture talent
- Workforce development
- Industry-relevant community engagement
- Perfect for Graduate and Apprenticeship programmes

Summary

Siemens

- Global engineering company
- Global academic programme
  - Industry leading software, certification, project-based learning and academic partnerships
- Industry-relevant project-based learning

Next steps

- Start using Siemens industry-leading technology
- Get involved in the **Greenpower Challenge**

Thank you

Mike Brown
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Digital Factory/mainstream engineering

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