

Envision end of test 5th grade PDF

envision end of test 5th grade marks a significant milestone in a student's academic journey. As fifth graders prepare to close out their elementary school year, the focus often shifts toward understanding what to expect on the upcoming standardized tests, how to effectively prepare, and ways to approach the test with confidence. These assessments not only evaluate students' grasp of core subjects like math, reading, and science but also help teachers identify areas needing reinforcement before moving on to middle school. Whether you're a parent, teacher, or student, understanding the structure and strategies for envision end of test 5th grade can make the preparation process smoother and less stressful.

Understanding the Envision End of Test 5th Grade

What is the Envision Test?

The Envision test is a comprehensive assessment used to evaluate fifth-grade students' mastery of essential skills aligned with state standards. It typically covers subjects such as mathematics, reading comprehension, language arts, and science. The goal is to ensure students are prepared for the next academic level and to provide educators with insights into student progress.

Test Format and Structure

The Envision end-of-year assessments are designed to mirror the curriculum content students have learned throughout the year. Key features include:

- **Multiple Choice Questions:** Most sections involve multiple-choice items that test students' understanding and application of concepts.
- **Short Answer/Constructed Response:** Some sections may require students to write brief responses to demonstrate reasoning skills.
- **Interactive Components:** In some cases, digital tests include interactive elements or drag-and-drop questions to assess problem-solving skills.

Understanding this structure helps students approach each section with appropriate strategies.

Key Subjects Covered in the 5th Grade Envision Test

Mathematics

Mathematics is a major component of the Envision assessment, focusing on:

- Place value and number operations
- Fractions, decimals, and percentages
- Geometry and measurement
- Data interpretation and probability

Preparing for math involves practicing problem-solving, understanding word problems, and mastering foundational concepts.

Reading Comprehension

Reading sections assess students' ability to:

- Identify main ideas and supporting details
- Make inferences and draw conclusions
- Understand vocabulary in context
- Analyze literary elements such as theme and character

Developing reading stamina and critical thinking skills is crucial for success.

Language Arts and Grammar

This part of the test evaluates:

- Grammar and punctuation skills
- Writing clarity and coherence
- Vocabulary knowledge
- Editing and revising skills

Students should practice writing short essays and sentences to demonstrate mastery.

Science

Science questions typically focus on:

- Earth and space science

- Life science and ecosystems
- Physical science concepts
- Scientific inquiry and experimentation

Hands-on experiments and understanding scientific vocabulary can enhance performance.

Effective Strategies for Envision End of Test 5th Grade Preparation

Establish a Study Routine

Consistency is key. Create a study schedule that balances review sessions across subjects, allowing students to revisit challenging topics regularly.

Use Practice Tests and Sample Questions

Practicing with sample questions familiarizes students with the test format and timing. Resources include:

- Official practice tests provided by the school or testing agency
- Online practice quizzes and interactive exercises
- Study guides and flashcards for vocabulary and key concepts

Focus on Weak Areas

Identify subjects or topics where students struggle and allocate extra time to strengthen those skills. Teachers can provide targeted interventions or additional resources.

Develop Test-Taking Skills

Encourage students to:

- Read questions carefully
- Manage their time effectively during the test
- Use process of elimination for multiple-choice questions
- Remain calm and confident

Encourage Critical Thinking and Problem-Solving

Beyond memorizing facts, students should practice reasoning through problems, especially in math

and science, to improve their analytical skills.

Supporting Students Emotionally and Mentally for Test Day

Build Confidence through Positive Reinforcement

Praise efforts and progress, emphasizing that doing their best is what matters most.

Establish a Healthy Routine

Ensure students get adequate sleep, nutritious meals, and physical activity leading up to the test day to optimize mental alertness.

Teach Relaxation Techniques

Breathing exercises, mindfulness, or simple stress-relief strategies can help students stay calm during the test.

Prepare Logistically

Ensure students know the test schedule, location, and what to bring, such as pencils, erasers, and a calculator if permitted.

Post-Test Reflection and Next Steps

Review Results and Feedback

Once scores are available, review them with students to identify strengths and areas for improvement.

Celebrate Achievements

Acknowledge students' hard work regardless of the outcome to foster a growth mindset.

Plan for Continued Learning

Use the results to guide future learning goals, whether it's reinforcing certain skills or exploring new topics in the summer or the following school year.

Conclusion

Envision end of test 5th grade is more than just a milestone ? it's an opportunity to assess progress, build confidence, and set the stage for future academic success. By understanding the test structure, focusing on targeted preparation strategies, and supporting students both academically and emotionally, parents and educators can help fifth graders approach their assessments with confidence and resilience. Remember, the goal is not only to achieve high scores but also to develop a love for learning and a strong foundation for the challenges ahead.

Envision End of Test 5th Grade: A Comprehensive Guide to Navigating and Excelling in the Final Assessment

As the school year draws to a close, many educators, parents, and students focus on the significance of the Envision End of Test 5th Grade. This comprehensive assessment serves as a pivotal milestone, not only measuring students' mastery of fundamental skills but also preparing them for the academic challenges ahead in middle school. Understanding the structure, content, and best strategies for success in this exam can empower students to perform confidently and effectively. In this guide, we'll explore everything you need to know about the Envision End of Test for 5th graders, from its purpose to practical tips for preparation.

What Is the Envision End of Test 5th Grade?

The Envision End of Test 5th Grade is an end-of-year assessment aligned with the Envision math and language arts curricula. It is designed to evaluate students' proficiency across key academic areas covered throughout the year. The test acts as both a summative assessment, gauging overall achievement, and a diagnostic tool, helping educators identify areas where students excel or need additional support.

This test typically covers:

- Math concepts such as fractions, decimals, geometry, and data interpretation
- Reading comprehension and vocabulary
- Writing and language skills
- Critical thinking and problem-solving abilities

The results of this test influence classroom instruction moving forward and can also impact promotion decisions, making it an essential component of the fifth-grade experience.

The Structure of the Envision End of Test for 5th Grade

Understanding the structure of the test helps students approach it with confidence. The Envision End of Test generally comprises several sections, each focusing on different skill areas:

- Multiple Choice Questions
 - Usually the majority of the test
 - Designed to assess understanding of core concepts
 - Tasks include selecting correct answers based on problem prompts
- Short Answer or Constructed Response
 - Require students to explain reasoning or demonstrate problem-solving steps
 - Used to assess critical thinking and mastery of concepts
- Performance Tasks or Extended Response
 - More complex questions integrating multiple skills
 - Often involve real-world applications, such as data analysis or writing prompts
- Listening or Oral Components (if applicable)
 - Some versions may include oral questions to evaluate verbal reasoning

Key Content Areas Covered

Mathematics

- Fractions, decimals, and percentages
- Ratios and proportions
- Basic algebraic concepts
- Geometry (angles, area, perimeter)
- Data interpretation (charts, graphs)
- Measurement and unit conversions

English Language Arts

- Reading comprehension (main idea, details, inference)
- Vocabulary development
- Grammar and sentence structure
- Writing narratives, essays, and responses
- Analyzing texts and making connections

Critical Thinking & Problem Solving

- Applying learned strategies to unfamiliar problems
- Making logical inferences
- Using evidence to support answers

Preparing for the Envision End of Test 5th Grade

Effective preparation is the key to success. Here are strategies categorized into study habits, practice resources, and mindset tips.

Study Habits

- Consistent Review: Regularly revisit topics covered throughout the year rather than cramming last minute.
- Use of Study Guides: Utilize Envision-specific practice worksheets and review packets.
- Flashcards: Create vocabulary and math fact flashcards for quick review.
- Practice Tests: Complete full-length practice exams to familiarize with the test format and timing.

Practice Resources

- Official Envision Practice Tests: Many districts or schools provide sample tests aligned with the curriculum.
- Online Platforms: Educational websites offering interactive quizzes and lessons aligned with the fifth-grade standards.
- Teacher Support: Seek guidance from teachers for targeted review of challenging topics.
- Study Groups: Collaborate with classmates to review material and discuss problem-solving approaches.

Mindset and Test-Day Strategies

- Positive Attitude: Encourage confidence and a growth mindset.
- Time Management: Practice pacing to ensure all questions are answered within the allotted time.
- Rest & Nutrition: Ensure adequate sleep and balanced meals before test day.
- Stress Reduction: Incorporate relaxation techniques such as deep breathing or visualization.

Tips for Success During the Test

On the day of the exam, students can implement specific strategies to maximize their performance:

- Read Directions Carefully: Ensure understanding before answering.
- Answer Easy Questions First: Build confidence by tackling familiar questions early.
- Manage Time Wisely: Allocate appropriate time per section; don't linger too long on difficult questions.
- Show Your Work: For math problems, clearly demonstrate reasoning to earn partial credit if needed.
- Review Answers: If time allows, double-check responses for mistakes or overlooked details.
- Stay Calm: Maintain focus, and remember that effort and preparation count more than perfection.

Post-Test Reflection and Next Steps

After completing the Envision End of Test 5th Grade, it's beneficial for students and parents to review results together:

- Identify Strengths: Celebrate areas where the student performed well.
- Recognize Areas for Improvement: Use results to target skills needing reinforcement.
- Plan for the Future: Transition smoothly into middle school with confidence, addressing any gaps in knowledge.

Remember, standardized tests are just one measure of academic progress. The goal is to foster a love of learning and resilience that carries beyond test scores.

Final Thoughts

The Envision End of Test 5th Grade is a comprehensive assessment that offers invaluable insights into a student's academic journey. Proper understanding of its structure, content, and preparation strategies can significantly influence a student's confidence and performance. By adopting consistent study habits, utilizing available resources, and maintaining a positive mindset, fifth

graders can approach this milestone with readiness and enthusiasm. Ultimately, the test is a stepping stone?marking the culmination of a year's hard work and the beginning of new opportunities in middle school and beyond.

QuestionAnswer What is the purpose of the Envision End of Test for 5th grade? The Envision End of Test for 5th grade is designed to assess students' understanding of key concepts in math and language arts, helping teachers gauge their readiness for the next grade level. How can students best prepare for the Envision End of Test in 5th grade? Students can prepare by reviewing their class notes, practicing sample questions, understanding test formats, and seeking help from teachers or tutors on challenging topics. What types of questions are included in the Envision End of Test for 5th graders? The test includes multiple-choice questions, short answer prompts, and problem-solving tasks covering subjects like math, reading comprehension, and vocabulary. Are there practice tests available for the Envision End of Test for 5th grade? Yes, teachers and educational websites often provide practice tests and sample questions to help students familiarize themselves with the test format and content. How is the Envision End of Test scored for 5th grade students? The test is scored based on the number of correct answers, with results used to identify areas where students excel or need additional support. What skills are most important to focus on for success in the Envision End of Test? Key skills include reading comprehension, math problem-solving, critical thinking, and understanding of grade-level vocabulary and concepts. When is the typical scheduled date for the Envision End of Test for 5th graders? The testing usually occurs towards the end of the school year, often in late May or early June, but specific dates can vary by school district. How can parents support their child in preparing for the Envision End of Test? Parents can encourage regular study routines, provide a quiet and comfortable study environment, review practice questions together, and ensure their child gets enough rest before the test. What should students do on the day of the Envision End of Test to perform their best? Students should arrive early, stay calm, read each question carefully, manage their time wisely, and trust in their preparation. How are the results of the Envision End of Test used to help 5th grade students? Results help teachers identify students' strengths and weaknesses, informing instruction and providing targeted support to improve learning outcomes.

Related keywords: 5th grade test, test completion, exam ending, student assessment, grade 5 exam, test results, academic testing, educational assessment, school testing, end of year test

Microsoft Test Manager Tutorial

Microsoft Test Manager Tutorial: A Comprehensive Guide to Efficient Test Management

In the world of software development, ensuring the quality and reliability of your applications is

paramount. Microsoft Test Manager (MTM) is a powerful tool designed to streamline the testing process, enabling teams to plan, execute, and track testing efforts with ease. Whether you're a beginner or looking to enhance your testing workflows, this **Microsoft Test Manager tutorial** will provide you with a step-by-step guide to harnessing MTM's full potential for your projects.

Understanding Microsoft Test Manager

Before diving into the tutorial, it's essential to grasp what Microsoft Test Manager is and how it integrates into the broader Visual Studio ecosystem.

What is Microsoft Test Manager?

Microsoft Test Manager is a test management tool integrated with Visual Studio Team Services (VSTS) and Azure DevOps. It provides an intuitive interface for managing test plans, creating and executing test cases, and tracking testing progress. MTM supports both manual and exploratory testing, making it versatile for various testing scenarios.

Key Features of Microsoft Test Manager

- Test Planning: Create and organize test plans, test suites, and test cases.
- Test Execution: Execute manual tests and record results efficiently.
- Test Tracking: Monitor testing progress and generate detailed reports.
- Exploratory Testing: Conduct ad-hoc testing sessions with session-based testing capabilities.
- Integration: Seamlessly connects with Azure DevOps for continuous testing workflows.

Setting Up Microsoft Test Manager

Getting started with MTM involves installing and configuring the tool for your environment.

Prerequisites

- Visual Studio Enterprise or Professional edition (with test management features).
- Azure DevOps account or TFS (Team Foundation Server) setup.
- Appropriate permissions to access test management features.

Installing Microsoft Test Manager

- Download the Visual Studio Installer from the official Microsoft website.

- Choose the edition that includes testing tools (e.g., Visual Studio Enterprise).
- During installation, select the "Testing Tools" workload to install MTM.
- Complete the installation and launch Visual Studio.
- Connect to your Azure DevOps project or TFS server within Visual Studio.

Creating and Managing Test Plans

A well-structured test plan is the foundation of successful testing. MTM simplifies organizing your testing efforts through test plans and suites.

Creating a Test Plan

- Open Microsoft Test Manager from Visual Studio or the Azure DevOps portal.
- Navigate to the "Test Plans" section.
- Click "New Test Plan" and provide a descriptive name, description, and start/end dates.
- Associate the test plan with a specific build or release if needed.
- Save the test plan to begin adding test cases.

Organizing Test Suites

Test suites help categorize test cases based on features, modules, or testing strategies.

- **Static Test Suites:** Manually organize test cases into logical groups.
- **Requirement-Based Test Suites:** Link test cases to specific requirements or user stories.
- **Query-Based Test Suites:** Dynamically generate test cases based on queries.

Adding Test Cases

- Within your test suite, click "New Test Case" or import existing cases.
- Define the test case steps, expected results, and associated requirements.
- Assign priority, owner, and other metadata to facilitate management.
- Save the test case to include it in your suite.

Executing Tests with Microsoft Test Manager

Once your test cases are organized, the next step is executing tests and recording results.

Manual Test Execution

- Open the test plan and select the test suite to execute.
- Click "Run" on the test case you wish to execute.
- Follow the test steps as documented, marking each step as "Passed" or "Failed."
- If a test fails, record detailed bug information directly from the test runner.
- Complete the test run, and the results will be saved automatically.

Using Action Recording and Data Collection

MTM allows capturing detailed logs and screenshots during test execution, aiding in defect analysis and reproducibility.

Exploratory Testing

For ad-hoc testing, MTM offers session-based testing:

- Schedule a testing session with session details.
- Conduct testing while documenting observations and findings.
- Record bugs and issues discovered during the session.

Tracking and Reporting Testing Progress

Effective test management requires insight into testing status and quality metrics.

Monitoring Test Results

- Navigate to the "Test Results" section in MTM or Azure DevOps.
- Review individual test case outcomes and overall progress.
- Filter results by tester, status, or test plan for detailed analysis.

Generating Reports

MTM provides various built-in reports to visualize testing status:

- Test Results Summary
- Test Case Progress and Trends
- Bugs and Defects Reports

Integrating with Bug Tracking

During testing, bugs can be logged directly from MTM, linked to specific failed test cases, ensuring traceability and quick resolution.

Advanced Tips and Best Practices

Maximize your testing efficiency with these expert tips:

Automate Repetitive Tests

Integrate MTM with automated testing frameworks like MSTest, NUnit, or Selenium to run automated tests alongside manual efforts.

Maintain Test Cases Regularly

Keep your test cases updated with application changes to ensure relevance and accuracy.

Use Tags and Filters

Leverage tags and filters to quickly locate and execute specific test cases based on criteria like priority, feature, or owner.

Collaborate Effectively

Encourage team collaboration by sharing test plans and results, and conducting regular review meetings to discuss testing progress.

Conclusion

Microsoft Test Manager is an essential tool for teams aiming to implement structured and efficient testing workflows. From creating comprehensive test plans and organizing test suites to executing tests and tracking outcomes, MTM provides a centralized platform that enhances test visibility and quality assurance. By following this **Microsoft Test Manager tutorial**, you can streamline your testing process, improve defect detection, and deliver higher-quality software products. Remember to stay updated with the latest features and best practices to maximize your testing success with MTM.

Microsoft Test Manager tutorial: A Comprehensive Guide to Streamlining Your Testing Process

Microsoft Test Manager (MTM) is a powerful tool integrated within the Azure DevOps suite, designed to facilitate efficient test planning, management, and execution. Whether you are a QA professional, a developer, or a project manager, mastering MTM can significantly enhance your

testing workflows, improve defect detection rates, and ensure higher quality software releases. This tutorial aims to provide an in-depth overview of Microsoft Test Manager, guiding you through its features, setup, best practices, and real-world applications.

Introduction to Microsoft Test Manager

Microsoft Test Manager is a dedicated testing management environment that helps teams plan, execute, and track testing activities seamlessly. Originally part of Visual Studio Test Professional, MTM is now integrated within Azure DevOps, offering a unified platform for Agile testing, exploratory testing, and manual test case management.

Key Features of Microsoft Test Manager

- Test Planning: Create and organize test plans, test suites, and test cases.
- Test Execution: Run manual tests, record results, and capture screenshots.
- Test Management: Track defects, manage test configurations, and generate reports.
- Integration: Seamlessly connect with Azure DevOps for continuous integration and automated testing workflows.
- Exploratory Testing: Record exploratory sessions with detailed notes and recordings.

Setting Up Microsoft Test Manager

Before diving into testing, proper setup of MTM is essential.

Prerequisites

- A valid Azure DevOps account with appropriate permissions.
- Installed Visual Studio Test Professional or access via Azure DevOps.
- Access to a test environment or lab machines.

Installation and Configuration

- Download and Install: Download Microsoft Test Manager from the Visual Studio downloads page or via Azure DevOps.
- Connect to Azure DevOps: Launch MTM and connect it to your Azure DevOps project by signing in with your credentials.
- Configure Test Environments: Set up test machines, configurations, and network environments to align with your testing needs.

Tips for Effective Setup

- Organize your test plans hierarchically for easier management.
- Maintain a clear mapping between test environments and real-world configurations.
- Regularly update test artifacts to ensure they reflect current application versions.

Creating and Managing Test Plans

Test planning is the foundation of effective testing.

Creating a Test Plan

- In MTM, navigate to the "Test Plans" section.
- Click "New Test Plan" and provide a descriptive name, start/end dates, and any relevant details.
- Assign ownership and stakeholders.

Organizing Test Suites

- Static Test Suites: Manually added test cases grouped logically.
- Requirement-based Suites: Linked to user stories or requirements for traceability.
- Query-based Suites: Dynamic grouping based on queries.

Best Practices

- Break down large test plans into smaller, manageable suites.
- Link test cases to user stories or bugs for better traceability.
- Regularly review and update test plans to reflect current project scope.

Designing and Managing Test Cases

Creating effective test cases is critical to uncovering defects early.

Writing Test Cases

- Clear, concise steps with expected results.
- Use descriptive titles and tags for easy filtering.

- Include preconditions and postconditions.

Reusing Test Cases

- Modularize test steps for reuse across different test cases.
- Attach relevant documentation, screenshots, or scripts.

Organizing Test Cases

- Group related test cases into shared test suites.
- Use labels and tags for categorization.

Tips for Effective Test Cases

- Prioritize test cases based on risk and impact.
- Keep test cases up-to-date with application changes.
- Incorporate exploratory testing notes within test cases or as separate sessions.

Test Execution and Result Recording

Executing tests efficiently and accurately recording results is vital.

Running Manual Tests

- Select a test case from your test suite.
- Follow each step, observing the actual behavior.
- Record outcomes: Passed, Failed, Blocked, or Not Applicable.
- Capture screenshots or record videos if needed.

Recording Defects

- Link defects directly to failed test cases.
- Provide detailed descriptions, steps to reproduce, and severity.
- Attach logs or screenshots to aid debugging.

Managing Test Runs

- Use test configurations to run multiple test cases under different environments.
- Schedule and assign test runs to team members.
- Monitor real-time progress and results.

Pros and Cons of Test Execution Features

Pros:

- Streamlined process for manual testing.
- Rich media capture for detailed documentation.
- Easy defect linkage and traceability.

Cons:

- Manual process can be time-consuming for large test suites.
- Limited automation capabilities within MTM itself.

Integrating Automated Testing with Microsoft Test Manager

While MTM excels at manual testing, integration with automated testing frameworks enhances overall efficiency.

Integration with Visual Studio Test Automation

- Use Visual Studio Test tools to develop automated test scripts.
- Link automated tests to test cases in MTM.
- Run automated tests as part of continuous integration pipelines.

Benefits of Integration

- Reduces manual effort.
- Ensures consistency between manual and automated testing.
- Facilitates comprehensive test coverage.

Limitations

- Setup can be complex for beginners.
- Requires scripting knowledge for automation.

Reporting and Tracking

Effective reporting provides insights into testing progress and quality metrics.

Built-in Reports

- Test Run Summary
- Test Results Trend
- Defect Status and Age
- Requirements Traceability Matrix

Custom Reports

- Use Azure DevOps Analytics or Power BI for tailored dashboards.
- Export data for external analysis.

Best Practices

- Regularly review reports to identify bottlenecks.
- Use metrics to prioritize testing efforts.
- Maintain up-to-date dashboards for stakeholder visibility.

Best Practices for Using Microsoft Test Manager

- Plan Early: Incorporate testing early in the development lifecycle.
- Maintain Test Artifacts: Keep test cases and plans updated with application changes.
- Leverage Linkages: Connect requirements, test cases, defects, and build versions.
- Automate Where Possible: Use automation to handle repetitive and regression testing.
- Collaborate: Engage team members through shared test plans and results.
- Review Regularly: Conduct test reviews and retrospectives for continuous improvement.

Common Challenges and How to Overcome Them

Challenge: Managing Large Test Suites

Solution: Break down into smaller, manageable suites; use query-based suites for dynamic grouping.

Challenge: Keeping Test Cases Up-to-date

Solution: Establish a review cycle aligned with development sprints; assign ownership.

Challenge: Integration Complexity

Solution: Invest in automation and continuous integration pipelines; use documentation and training.

Challenge: Limited Automation within MTM

Solution: Use external automation tools integrated with Azure DevOps, such as Selenium or Coded UI.

Conclusion

Microsoft Test Manager is a robust tool that, when used effectively, can significantly boost your testing efficiency, coverage, and traceability. Its comprehensive features for test planning, execution, defect management, and reporting make it indispensable for teams adopting Agile and DevOps practices. While there are challenges, especially around automation and managing large test repositories, with proper setup, training, and best practices, MTM can become a cornerstone of your software quality assurance process.

By following this tutorial, you should now have a clear understanding of how to leverage Microsoft Test Manager to streamline your testing operations, improve collaboration, and ultimately deliver higher quality software to your users. Remember, continuous learning and adaptation are key to maximizing the benefits of MTM in your projects.

Question What are the main features of Microsoft Test Manager (MTM)? Microsoft Test Manager (MTM) provides features such as test planning, manual test execution, test case management, bug tracking integration, and collaboration tools to streamline the testing process within Visual Studio and Azure DevOps. **Answer** How do I create and organize test plans in Microsoft Test Manager? In MTM, you can create test plans by navigating to the 'Test Plans' hub, clicking 'New Test Plan,' and defining its name and details. You can then add test suites and test cases to organize tests based on requirements, features, or test types for better management. Can I automate tests using Microsoft Test Manager, and how is it integrated with other tools? While MTM primarily supports manual testing, it integrates seamlessly with Visual Studio and Azure DevOps, enabling automation through test scripts and frameworks like MSTest, Selenium, or CodedUI. Automated tests can be linked to test cases for comprehensive test management. What are the best

practices for using Microsoft Test Manager effectively? Best practices include maintaining detailed and reusable test cases, organizing tests into logical suites, utilizing shared steps for common actions, integrating with bug tracking, and regularly updating test plans based on project changes to ensure thorough testing coverage. Is Microsoft Test Manager suitable for Agile development environments? Yes, MTM is well-suited for Agile teams as it supports iterative testing, easy integration with Azure DevOps Agile tools, and flexible test planning, allowing teams to adapt testing activities to sprint cycles and continuous delivery workflows.

Related keywords: Microsoft Test Manager, TFS testing, test planning, test case management, automated testing, test execution, bug tracking, test lab management, test reporting, test automation tools

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